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Std. : X

5151

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In 5151

SCIENCE

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Std. X

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Kedar Prakashan,
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Preface

The government of Maharashtra has accepted a new pattern of education, according to which the courses have been revised. The main objective in this new pattern of education is that the students should have a good knowledge of the subject matter, and to create interest in the subject. However, evaluation of these is possible mainly through a written examination. A good student usually goes through the question-papers set for last few years. And we are sure that this book ' 51 papers in science ' will serve the purpose. This book contains 17 question papers, each in Physics, Chemistry and Biology. Care has been taken to include a wide variety of questions based on the modern evaluation techniques. We hope that some questions will prove challanging even to the intelligent students.

—Authors

THE BOOK CONTAINS

PHYSICS

PAPER—1

Q. 1 (a) Complete the following sentences by selecting a proper word or phrase from the given alternatives; and rewrite them.

(1) The two vectors $\vec{PQ}$ and $\vec{QP}$ are such that.. 1

(a) they are equal.

(b) their magnitudes are same but directions are opposite.

(c) they have same direction but have different magnitudes.

(d) their magnitudes as well as directions are different.

(2) A force of 1 dyne acting on a mass of 10gm. produces an acceleration of.... 1

(a) 1cm/s^2 (b) 10cm/s^2

(c) 0·1 cm/s^2 (d) 5cm/s^2

(3) One horse power is equivalent to ....watts. 1

(a) 10^5 (b) 10^7 (c) 746 (d) 980.

(4) A wooden block is floating on water. If the temperature of water is raised from 20°C to 80°C....

(a) the block will sink more.

(b) the block will sink less.

(c) the block will sink upto the same level as before.

(d) the block will sink completely.

(5) During a melting process, a crystalling substance....

(a) gains heat and the temperature increases.

(b) gains heat but temperature does not change.

(c) gains heat and temperature decreases.

(d) gains no heat and hence temperature remains constant.

(6) Size of ....in eye, determines the amount of light admitted. 1

(a) retina (b) sclerotic

(c) pupil (d) cornea.

(b) Match the pairs and rewrite them in your answer-paper. 2

Group–A	Group–B
(i) Current flow in metals	(1) Holes
(ii) Current flow in an electrolyte	(2) Electrons
	(3) Ions
(iii) Current flow in p-type semiconductor	(4) Neutrons
	(5) Thermions
(iv) Current flow through evacuated bulb.	(6) Ohms.

Q. 2 (1) When do you say that a body moves with constant velocity ? 1

(2) What is ' inertia ' ? 1

(3) Give one situation in which work done by the gravitational force is positive. 1

(4) Define ' pressure '. 1

(5) What is an ' amorphous substance ' ?

(6) State any two sources which give continuous spectra. 1

(7) Find the current flowing through a wire if a charge of 0·8 Coulomb enters its one end in two seconds. 1

(8) State two factors on which heat produced due to a resistance depends. 1

Q. 3 (a) State Newton's third law of motion. Give one example. 2

(b) (i) What is the cause of kinetic energy ? 1

(ii) Find the kinetic energy of a body of mass 5 kg moving at 2 m/s. 1

(c) (i) What is 'sublimation' ? 1

(ii) Name two substances which show sublimation 1

(d) Giving a suitable example explain what is meant by ' persistance of vision '.

Q. 4 (a) (i) Write down the cartesian co-ordinates of the points A (4,0°) and B (3,90°). 22

(ii) Measure and write the magnitude of $\vec{AB}$. 1

(b) A bullet of mass 20 gm is fired with the speed of 400 m/s Find the speed with which the gun of mass 4 kg will recoil. 1

(c) A rectangular metal block measuring 20 cm × 15 cm × 10 cm is placed on a wet clay such that the face 20 cm × 10 cm is at the top. What will you notice if it is placed with the face 15 cm × 10 cm at the top ? Why ? 2

(d) Name any one freezing mixture. What is the minimum temperature it can attain ? 2

OR

Q. 4 (a) (i) What do you mean by ' momentum of a body ' ? 1

(ii) Find the momentum of a body of mass 2 kg moving at 5 m/s 1

(b) (i) State Archimedes' principle. 1

(ii) Weight of the liquid displaced by a wooden block is (50 × 980) dynes. Write down the mass of the wooden block. 1

(c) (i) What is anomalous in the behaviour of water ? 1

(ii) Find the heat gained when 1 gm of ice at 0°C. is converted into 1 gm of steam at 100°C. 1

(d) Show the symbols used for (i) a cell (ii) a plug key (iii) a resistance and (iv) a variable resistance. 2

Q. 5 (a) Name the barometer used in aeroplanes. What is its advantage ? 2

(b) (i) What is the effect of pressure on boiling point ? 1

(ii) State one application of this effect. 1

(c) (i) What is the function of ciliary muscles in an eye ? 1

(ii) What is the unit used for power of a lens ? 1

(d) What is the use of (i) a neon detector and (ii) a fuse-wire ? 1

OR

Q. 5 (a) (i) For a moving body, you are given the distance travelled, time required, and the initial velocity. Which equation you will use to find the acceleration ? 1

(ii) What is the unit of energy in S. I. (M.K.S.) system ? 1

(b) (i) Dam walls are broader at the base. Why ? 1

(ii) What are the three types of emission spectra ? 1

(c) (i) What is a semi-conductor ? 1

(ii) What are the current carriers in p–type semiconductors ? 1

(d) You are using an electric bulb, an electric iron and a table fan. How will you detect the faulty instrument, if the fuse near the main switch is blown ? 2

PAPER 2

Q 1 (a) Complete the followring statements by selecting a proper word or phrase from the given alternatives and rewrite.

(1) The cartesian co-ordinates of a point M are $(\sqrt{3}, 1)$. The magnitude of the position vector of the point M must be—

(a) 2 (b) 3, (c) 4, (d) 10. 1

(2) A vehicle is moving with zero acceleration. Its speed at some time instant is 75 cm/s Its speed after 1 second must be—

(a) greater than 75 cm/s.
(b) less than 75 cm/s.
(c) 150 cm/s.
(c) 75 cm/s.

(3) The tendency of a body to remain in its state of rest or in a state of uniform linear motion is called as—

(a) momentum (b) force
(c) inertia (d) reaction. 1

(4) In S. I. (M.K.S.) system,....is the unit of potential energy—

(a) erg. (b) joule.
(c) watt (d) H. P. 1

(5) Aeroplanes use.....barometer—

(a) fortin's (b) water
(c)aneroid (d) glycerine. 1

(6) Example of an amorphous substance is.....

(a) water (b) iron.
(c) common salt (d) glass. 1

(b) Match the pairs and rewrite them. 2

A	B
(i) Potential difference	(1) $Q = \frac{I^2Rt}{4{\cdot}18}$
(ii) Total parallel resistance.	(2) IR
(iii) Heat produced (in joules)	(3) $(R_1 + R_2)$
	(4) $Q = I^2 Rt$
(iv) Total series resistance	(5) $\frac{1}{\left(\frac{1}{R_1} + \frac{1}{R_2}\right)}$

Q. 2 (1) State Newton's First Law of Motion 1

(2) What do you understand by the 'potential energy'? 1

(3) What is the condition for a body to float on a liquid? 1

(4) What is the temperature at which density of water is maximum? 1

(5) What is the function of optic nerves in an eye? 1

(6) A beam of sunlight undergoes a dispersion through a prism. Which of the constituent colours has a maximum deviation? 1

(7) State the condition for an electric current to flow between two points of a conductor. 1

(8) What do you mean by a '5-ampere fuse'? 1

Q. 3 (a) (i) When do you say that a body moves with some acceleration? 1

(ii) A force of 240 dyne acts on a body of mass 40 gm. Find the acceleration produced in the body. 1

(b) A body of mass 2kg rests on the table. If the area in contact measures 49 cm^2, find the pressure. 2

(c) Name four factors on which rate of evaporation depends. 2

(d) (i) What is 'power of accommodations' ? 1

(ii) What is 'near point' ? 1

Q. 4 (a) Give two examples of scalar quantities and two examples of vector quantities. 2

(b) Give reasons—

(i) It is dangerous to alight from a moving train 1

(ii) The gun recoils when a bullet is fired 1

(c) (i) What is the 'latent heat of fusion' ? 1

(ii) State the principle used in pressure cookers. 1

(d) Find the totat resistance when two resistances $R_1 = 10\Omega$ and $R_2 = 10\Omega$ are connected 2

(i) in series and (ii) in parallel.

OR

Q. 4 (a) State the principle ot conservation of linear momentum. Give one example in practice. 2

(b) Give reasons—

(i) Aneroid barometer can also be used as altimeter. 1

(ii) A body immersed in a liquid appears to be light. 1

(c) 10 gm of ice at 0°C is added to 30 gm of water at 44° C. Find the latent heat of fusion of ice if the temperature of the mixture is 13°C. 2

(d) (i) State the factors on which the electrical resistance of a wire depends. 1

(ii) State the use of main switch in house wiring. 1

Q. 5 (a) (i) What is the mass of the stone if its weight is 4900 dyne ? 1

(ii) Why does a piece of iron sink in water but float on mercury ? 1

(b) (i) What is the kinetic energy of a mass m moving with a velocity v ? 1

(ii) Find the kinetic energy of a mass of 0·8 kg moving at 5 m/s. 1

(c) (i) What is the power of a lens ? How is it related to focal length of a lens ? 1

(ii) Find the power of a convex lens of focal length 25 cm. 1

(d) Draw a diagram and explain Edison effect 2

OR

Q. 5 (a) What is the effect of pressure on melting point of ice ? Give one application of this effect. 2

(b) (i) What type of spectrum do we get from an ordinary bulb ? 1

(ii) Write down equation of Ohm's law. 1

(c) Meter reading 4253·7 KWH changes to 4277·7 KWH after one month. Find (i) the electrical energy consumed and (ii) its cost at 35 paise per unit. 2

(d) (i) How does a 'fuse' work ? 1

(ii) State the use of a neon-detector 1

PAPER 3

Q. 1 (a) Complete the following statements by selecting a proper word or phrase from the given alternatives and rewrite—

(1) In a cartesian frame of reference, the x coordinate of any point means—

(a) the distance of that point from x – axis.

(b) the distance of that point from y – axis.

(c) the distance of that point from the origin. 1

(2) If the force acting on a body is doubled, then the acceleration—

(a) will be reduced to half.

(b) will also be doubled.

(c) will remain constant. 1

(3) The kinetic energy of a sphere of mass 2 kg moving with a speed of 2 m/s, is given by—

(a) 4 ergs. (b) 2 joules.

(c) 8 ergs. (d) 4 joules. 1

(4) Dam walls are broader at the base than at the top because— 1

(a) pressure increases with depth.

(b) pressure decreases with depth.

(c) dams are rarely compltely filled.

(d) density of water is more at the bottom.

(5) When a liquid is heated —

(a) potential energy of the liquid molecules increases. 1

(b) kinetic energy of the liquid molecules increases.

(c) potential energy of the liquid molecules decreases. 1

(6) Eye-lens forms, on the retina, an image which is—

(a) real, inverted and diminished.

(b) real, erect and diminished.

(c) virtual, erect and magnified.

(d) virtual, erect and diminished. 1

(b) Insert the words 'current' and 'voltage' at proper places and rewrite. 1

"When resistances are connected in series, the division of..takes place with same.., while for a parallel connection, there is a division of..at same–"

Q. 2 Give reasons for the following.

(1) Weight of a body on earth is nearly 6 times the weight of that body on moon. 1

(2) Size of an air bubble formed in water, inereases as it moves upward. 1

(3) A bucket appears to be heavier as soon as it is drawn out of water.

(4) In cold countries, pipes carrying water burst. 1

(5) Objective of a telescope has large aperture. 1

(6) Experiments with a spectrometer are usually performed in a dark room. 1

(7) A wireman uses a neon-detector to identify the phase wire or the neutral wire. 1

(8) It is advisable to check periodically the house wiring. 1

Q. 3 (a) With a polar frame of reference, show the points A $(5, 0^\circ)$ and B $(3, 60^\circ)$. If O is the origin :—

(i) Show the vectors OA and AB. 1

(ii) Show $(\vec{OA} + \vec{AB})$. 1

(b) 'Concept of motion is relative to observer'. Explain giving one suitable example. 2

(c) State Newton's Third Law of motion. Give one example in practice to explain it. 2

(d) Three identical beakers respectively contain kerosene, glycerine and mercury, up to a height of 5 cm. Which of the three beakers will experience maximum pressure on the bottom ? Why ? 2

Q. 4 (a) What is sublimation ? How will you demonstrate that sublimaton takes place even at ordinary temperature ? 2

(b) What is short-sightedness (myopia) How can it be rectified ? 2

(c) (i) What type of emission spectrum is given by ordinary petromax lamp? 1

(ii) What is " presbyopia " due to ? 1

(d) (i) Define 'ampere'. 1

(i) Charge of 8 coulomb crosses the cross-section of a given wire in 2 seconds. Find the current flowing through the wire. 1

OR

Q. 4 (a) A sphere of mass 5kg moving at 20 m/s collides head on with another sphere of mass 10 kg, moving in the same direction at 10 m/s. Find—

(i) the momentum of first sphere before impact.

(ii) the momentum of second sphere before impact.

(iii) the total momentum of the system before impact.

(iv) the total momentum of the system after impact. 2

(b) (i) A body of mass m is moving with a velocity v

(1) Find its kinetic energy.

(2) What will happen to this kinetic energy if the velocity is doubled ? 3

(3) What will be the kinetic energy if only the direction of motion of the body is reversed ?

(ii) State the unit of potential ennrgy in M. K. S. system. 1

(c) Give reasons.

(i) In polar regions, animals and plants living under water are protected from being frozen to death. 1

(ii) Food can be cooked earlier in pressure cookers.

Q. 5 (a) Give two suitable examples to explain the concept of inertia. 2

(b) Find the heat required to convert 5 gm of ice at 0°C into 5 gm of steam at 100°C. 2

(c) What precautions should be taken in any electrical experiment ? 2

(d) Draw only a circuit diagram for experimental verification of Ohm's Law. Label the diagram. 2

OR

Q. 5 (a) (i) State Archimedes' principle. 1

(ii) A flat cylindrical wooden block of thickness 10 cm is submerged under water upto 4·8 cm. What is the density of wood ? 1

(b) State four points of difference between boiling and evaporation. 2

(c) (i) What will happen if a compass needle is moved away from a current-carrying conductor ? 1

(ii) What is meant by a 'Short circuit'? 1

(d) Find the electrical energy consumed if a 40 W table Lamp is used, daily for 5 hours, for 30 days in a month. 2

PAPER 4

Q. 1 (a) Complete the following statements by selecting a proper word or phrase from the given alternatives and rewrite.

(1) The body moves along a curved path and covers a distance of 4 meters in each second. The motion is an accelerated motion because—

(a) the speed is constant.

(b) the velocity is constant.

(c) the velocity is changing though speed is constant. 1

(2) A man having mass 60 kg. lands on moon. His weight on moon—

(a) will be 1/6th of his weight on earth.

(b) will be 6 times his weight on earth.

(c) will remain the same.

(3) A sphere moving at 3 m/s has a kinetic energy of 45 joule. Its mass must be— 1

(a) 15 kg. (b) 10 gm.

(c) 10 kg. (d) 15 gm.

(4) Pressure at a point in a liquid acts— 1

(a) only upward.

(b) only downward.

(c) only sideways.

(d) in all directions.

(5) In a human eye, ... is the part sensitive to light— 1

(a) iris (b) cornea

(c) retina (d) choroid.

(6) Ebonite is ..... of electricity— 1

(a) good conductor

(b) bad conductor

(c) semi-conductor

(d) an impurity semi-conductor.

(b) Match the pairs and rewrite them in your answer books. 2

Group A (Physical Quantity)	Group B (Unit)
(i) Acceleration	(1) metre/second
(ii) Momentum	(2) kg. metre
(iii) Force	(3) kg./second
(iv) Velocity	(4) kg. metre/second
	(5) metre/second^2
	(6) newton.

Q. 2 (a) What are vector quantities ? Give two examples. 2

(b) (i) If the polar co-ordinates of a point are (5, 90^0), write the cartesian co-ordinates of that point. 1

(ii) State the difference between ' speed ' and ' velocity '. 1

(c) A force is acting on a mass of 4 kg. and changes its velocity from 10 m/s to 25 m/s in a time of 3 seconds. Find—

(i) the initial momentum of the body.

(ii) the final momentum of the body.

(iii) the rate of change in momentum.

(iv) the force acting on the body. 2

(d) (i) What is ' anomalous behaviour of water ' ? 1

(ii) Name the apparatus which demonstrates this. 1

Q. 3 Give reasons for the following :—

(1) A soldier holds the rifle tightly before he fires. 1

(2) When a body moves on a horizontal table, the work done by the gravitational force is zero. 1

(3) A piece of iron sinks in water but a ship made of iron sheets floats on water. 1

(4) Wet clothes dry relatively earlier in summer than in rainy season. 1

(5) Short-sightedness is corrected by using a concave lens. 1

(6) Prism-table should be levelled before we use a spectrometer. 1

(7) The various electrical devices used in house are connected in parrallel. 1

(8) It is advisable to use a three-pin plug for an electric iron. 1

Q. 4 (a) (i) State Newton's First Law of motion. 1

(ii) What is ' inertia ' of a body ? 1

(b) (i) What do you mean by potential energy of a system ? 1

(ii) Give two examples of potential energy. 1

(c) Observe the data given below—

Identical beakers :	A	B	C
Liquids in them :	Water	Kerosene	Glycerine
Height of liquid column (cm.)	12	10	8
Densities of liquids (gm/cm^3)	1	0·8	1·25

(i) Which beaker will have maximum pressure on its base ? Why ? 2

(ii) Which beaker will have minimum pressure on its base ? Why ? 2

OR

Q. 4 (a) (i) What is the effect of pressure on boiling point ? 1

(ii) State any one application of this effect. 1

(b) You are given two resistances each of 10 Ω, and a dry cell of 1·5 volt.

(i) Draw a circuit diagram to show the parallel connection of the resistances, along with the cell. 1

(ii) Calculate the total resistance of the parallel combination. 1

(iii) Calculate the current flowing through the main circuit. 1

(iv) What will be the current through any one of the resistance ? 1

(c) How is the current flowing through a wire analogous to the flow of water through a pipe ? 2

Q. 5 (a) (i) State the use of a ' common hydrometer '. 1

(ii) What is ' condensation ' ? 1

(b) Draw a graph (of density on y–axis and temperature on x–axis) to show the variation of density of water between 0^0 C and 10^0 C. 2

(c) Draw only a ray diagram of refracting type of a telescope. 2

(d) (i) What is the function of a ' fuse ' ? 1

(ii) State the unit of electric current in M. K. S. system. 1

OR

Q. 5 (a) (i) Give one example of crystalline substance and one example of amorphous substance. 1

(ii) Considering the temperature during a melting process, how does a crystalline substance differ from an amorphous substance ? 1

(iii) What is the function of ciliary muscles in an eye ? 1

(iv) How can a sodium flame be produced in a laboratory ? 1

(v) What is a p–type semiconductor ? 1

(b) (i) Draw only a circuit diagram required for the experimental verification of Ohm's law. Label the different parts. 2

(ii) State Ohm's law. 1

PAPER 5

Q. 1 (a) Complete the following statements by selecting a proper word or phrase from the given alternatives and rewrite them—

(1) The polar co-ordinates of a point P are $(2\sqrt{2}, 45^\circ)$. The cartesian co-ordinates of this point must be—

(a) (2, 2) (c) $(\sqrt{2}, 2)$

(b) $(2, \sqrt{2})$ (d) $(\sqrt{2}, \sqrt{2})$ 1

(2) Two spheres A (mass 10 gm) and B (mass 20 gm) start moving down an inclined plane at the same time instant. Therefore—

(a) A will reach the lower end before B.

(b) B will reach the lower end before A.

(c) both will reach the lower end at the same time. 1

(3) A force of 200 dyne acting on a mass of 40 gm produces an acceleration of—

(a) 8000 cm/s^2 (c) 160 cm/s^2

(b) 50 cm/s^2 (d) 5 cm/s^2 1

(4) A wooden block is floating on water. The temperature of water is raised from 0°C to 3·5°C. It will submerge under water—

(a) more than before. (b) less than before.

(c) same as before. 1

(5) When a liquid is heated,—

(a) potential energy of the liquid molecules increases.

(b) kinetic energy of the liquid molecules increases.

(c) potential energy of the liquid molecules decreases.

(d) kinetic energy of the liquid molecules decreases. 1

(6) In our eye, ——— is the part sensitive to light.

(a) cornea (b) retina

(c) choroid (d) iris 1

(7) Match the pairs by selecting equivalent units from columns A and B, and rewrite the pairs.

A (unit—)	B (is equivalent to—).
(i) Erg	(p) 746 watts.
(ii) Joule	(q) 10^6 dynes
(iii) Watt	(r) newton metre
(iv) HP	(s) kg metre/second
	(t) joule/second.
	(m) dyne cm

Q. 2 (1) Write down the parallelogram law of vectors. 1

(2) For the motion of a body, if you know the initial velocity, the final velocity and the uniform acceleration, which equation will you use to find the distance travelled by the body ? 1

(3) State Newton's Third Law of motion. 1

(4) How is power related to work done ? 1

(5) What is meant by 'one atmosphere pressure' ? 1

(6) State Archimedes' principle. 1

(7) What is regelation ? 1

(8) Name the part of eye, the size of which determines the amount of light admitted into the eye. 1

Q. 3 (a) A lift of mass 500 kg starts moving upward with an acceleration of 0·98 m/s^2.

(i) Find the net upward force. 1

(ii) What is the gravitational force acting on the lift ? 1

(iii) Hence find the upward pull. 1

(b) Draw only the figures to show that—

(i) Pressure in a liquid increases as we go deeper and deeper. 2

(ii) pressure at a given depth depends upon the density of the liquid. 2

(c) When do we say that air is saturated with vapour ? 1

Q. 4 (a) (i) What do you mean by 'negative of a vector'? 1

(ii) Find the power of an engine if it does a work of 40 joule in 16 seconds.

(b) 20 gm of ice at 0°C is added to 85gm of water at 25°C. If the temperature of the mixture is 5°C,— 2

(1) find the total heat lost by water.

(2) find the heat gained by water formed from ice.

(3) hence find the heat gained by ice during melting, and

(4) find the latent heat of fusion of ice. 1

(c) (i) What adjustments are necessary for observations with a spectrometer ? 2

(ii) State the three types of emission spectra. 1

(iii) Which of the two lenses of a telescope has a larger diameter ? Why ? 1

OR

Q. 4. (a) (i) What is an amorphous substance ?

(ii) State four factors on which rate of evaporation depends.

(iii) Why there is no change in temperature during a melting process even if heat is supplied to a crystalline substance ? 1

(b) Using the equation $Q=\frac{I^2 Rt}{4{\cdot}18}$ cal. find the heat produced by a resistance of 4180 ohms, when a current of 50 mA flows through it for 30 seconds. 2

(c) Find the current passing through a filament of 60w bulb when the P. D. is 230 volts. 2

Q. 5. (a) What is the effect on the boiling point of a liquid when some soluble substance is added to it? Describe a simple experiment to demonstrate this effect. 2

(b) (i) What do you mean by 'power of accommodation'? 1

(ii) What type of lens is used to correct the defect of long sightedness? Why? 1

(c) State any two modes of electric current flow. 1

(d) Find the energy consumption during 30 days of a month, at the rate of 35 paise per unit if I use a table lamp of 25 W, daily for 2 hours, a tube lamp of 40 W, daily for 5 hours and a water heater of 1000 W, daily for 15 minutes. 3

OR

Q. 5. (a) Give one example for each of the following —

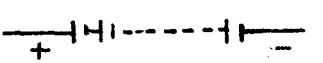
(i) Only a rotational motion.

(ii) Only a translational motion.

(iii) Rotational and translational motion. 3

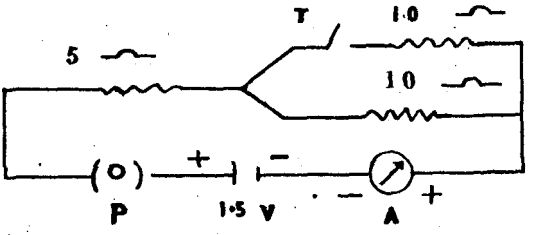
(b) What are the following symbols used for? 1

(i) 

(ii) 

(Fig. Paper 5·1)

(c) Observe the following circuit diagram and answer the questions that follow. 4



(Fig. Paper 5·2)

(1) What will be the total resistance in the circuit when T is closed along with P ?

(2) What will be the total resistance in the circuit when T is open and P is closed ?

(3) Calculate the current when T is closed.

(4) Calculate the current when T is open.

PAPER 6

Q. 1 (a) Complete the following Statements by selecting a proper word or phrase from the given alternatives and rewrite.

(1) The two vectors $\vec{PQ}$ and $\vec{QP}$ are such that —

(a) they are equal.

(b) they have same magnitude but opposite directions.

(c) they have different magnitudes but same direction.

(d) they have different magnitudes and also different directions.

(2) The motion of wheels of a moving car is — 1

(a) only a rotational motion.

(b) only a vibrational motion.

(c) a translational and rotational motion.

(d) only a translational motion.

(3) The momentum of a body depends — 1

(a) only on the mass of the body.

(b) only on the velocity of the body.

(c) on mass and speed of the body.

(d) on mass and velocity of the body.

(4) The solid of density 3·4 gm/cm^3, will sink in a liquid— 1

(a) of density 4·3 gm/cm^3

(b) of density 7 gm/cm^3

(c) of density 2·5 gm/cm^3

(d) of density 4·0 gm/cm^3

(5) During a melting process, the crystalline substance — 1

(a) gains heat and temperature increases.

(b) gains heat but temperature remains constant.

(c) gains no heat but still temperature increases.

(d) gains no heat and hence temperature remains constant.

(6) For various electrical devices at our home — 1

(a) same current passes but P. D. is different.

(b) same current passes at same potential difference.

(c) current passing and P. D. both are different.

(d) current passing is different but P. D. is same.

(b) Group A gives names of various parts of an eye and group B, the functions performed. Match the pairs and rewrite them in your answerbook.

Group A	Group B
(i) Iris	(1) Communicates the information of image to the brain.
(ii) Ciliary muscles	(2) Change the focal length of the eye lens.
(iii) Optic nerves	(3) Changes the size of the pupil and thus controls light entering the eye.
(iv) Sclerotic	(4) Protects the eye-ball 2
(v) Cornea	
(vi) Choroid	

Q. 2 Give scientific reasons for the following —

(1) It is dangerous to alight from a moving bus. 1

(2) Bottles which contain mercury have thick walls and thick base. 1

(3) Ice filings can be pressed together to form an ice-ball. 1

(4) Objective of a telescope has a large aperture. 1

(5) Prism table of a spectrometer should be made horizontal. 1

(6) A compass needle deflects when taken near a current carrying conductor. 1

(7) Fuse wire melts if a large current passes through it. 1

(8) Switch for an individual electrical device is provided on the phase wire and not on the neutral wire. 1

Q. 3 (a) (i) Show the points (3, 0°) and (4, 90°) on the polar frame of reference. 1

(ii) Measure the distance between these two points. 1

(b) (i) A train A moving at 25 m/s overtakes another train B moving at 20 m/s, when they are moving on parallel rails. Find the velocity of train A relative to B. Also find the velocity of train B relative to A. 1

(ii) A stone is released from a tower. If $g = 9{\cdot}8$ m/s², find the speed of the stone after 2 seconds. 1

(c) A pump works for 49 seconds and lifts 746 kg of water through a height of 5 metres. 3

(i) Find the work done by the pump.

(ii) Find the power of the pump in watts.

(iii) Express this power in hp. 1

(d) Write two uses of aneroid barometer. 1

Q. 4 (a) (i) With the help of a neat diagram, explain the use of Hare's apparatus. 2

(ii) In Hare's apparatus, water column of height 10 cm balances glycerine column of hight 8 cm. Find the density of glycerine. 1

(b) (i) Draw and label, a neat diagram of Hope's Apparatus. 1

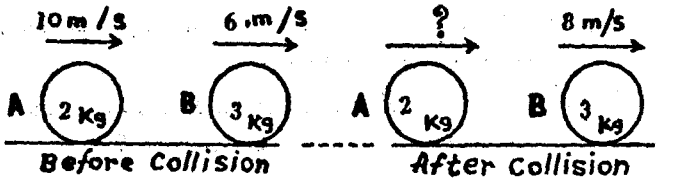
(ii) State the use of Hope's apparatus. 1

(c) (i) Draw only a circuit diagram involving a parallel combination of two resistances and a dry cell such that it is possible to measure current through them separately. Name the parts. 2

(ii) State two factors on which resistance of a wire depends. 1

OR

Q. 4 (a) From the following figure, answer the questions that follow, 3



(Fig. Paper 6·1)

(i) What is the total momentum of both the spheres before collision ?

(ii) What must be the total momentum of both the spheres after collision ?

(iii) Find the momentum of sphere B after collision.

(iv) Find the momentum of sphere A after collision.

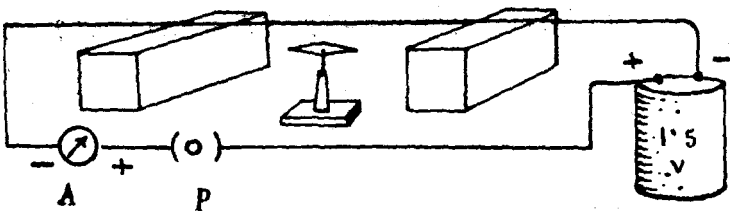
(v) Find the velocity of sphere A after collision.

(vi) State the principle used in this problem.

(b) (i) What is ' latent heat of fusion ' ? 1

(ii) What is a ' freezing mixture ' ? 1

(c) (i) Describe the experiment which makes use of the arrangement shown below. 2



(Fig. Paper. 6·2)

(ii) Find the total resistance when two resistances each of 4 ohm are connected in parallel. 1

Q. 5 (a) (i) State Newton's Second Law of Motion. 1

(ii) What is meant by 'Inertia' ? 1

(iii) Give only one example which explains Newton's Third Law of Motion. 1

(b) (i) State the unit of energy in M.K.S. system. 1

(ii) How can an elephant be weighed ? 2

(c) Draw only a circuit diagram for experimental verification of ohm's law. Name the parts. 2

OR

Q. 5 (a) (i) What can you say about the temperature during the melting process of an amorphous solid ? 1

(ii) Give one common example of a substance which expands on melting. 1

(b) (i) Find the heat gained when 10 gm of ice at 0°C is converted into 10 gm of water at 80°C if latent heat of fusion of ice is 80 cal/gm. 2

(ii) How much heat is required for 1 gm of water at 100°C to convert into 1 gm of steam at 100°C ? 1

(c) (i) You are using a table fan, an electric iron and a tube lamp. If the fuse near main switch is blown, how will you detect the faulty device ? 2

(ii) What do you mean by a '5-ampere fuse' ? 1

PAPER 7

Q. 1 (a) Complete the following statements by selecting a proper word or phrase from the given alternatives and rewrite the statements.

(1) $\vec{PQ}$ and $\vec{QR}$ are collinear vectors, both pointing towards east. If their magnitudes are 6 and 4 respectively, the magnitude of $\vec{PR}$ must be.... 1

(a) 2 (b) 10 (c) 24 (d) 8

(2) A bullet is fired from a rifle, the mass of which is 200 times the mass of the bullet. The rifle will, therefore, recoil with speed.... 1

(a) equal to the speed of the bullet.

(b) greater than the speed of the bullet.

(c) $\frac{1}{200}$ th of the speed of the bullet.

(d) 200 times the speed of the bullet.

(3) A moving sphere of mass 5 kg has a kinetic energy of 40 joules. Its velocity must be..... 1

(a) 8 m / s (b) 4 m / s

(c) 2 m / s (d) $\sqrt{200}$ m / s

(4) A solid will float on liquid if the buoyancy force is.....the weight of the solid. 1

(a) equal to (b) greater than

(c) less than.

(5) During the melting process of any crystalline substance, the temperature shown on the thermometer 1

(a) increases.

(b) decreases.

(c) remains constant.

(6) Eye is protected from stray light by.... 1

(a) retina (b) cornea (c) iris (d) choroid

(b) Match the pairs and rewrite in your answer book. 2

A	B
(i) Current flow in metals	(1) Holes
(ii) Current flow in an electrolyte	(2) Electrons

A	B
(iii) Current flow in a p-type semiconductor	(3) Ions
	(4) Neutrons
(iv) Current flow in an evacuated bulb	(5) Thermions

Q. 2 Give reasons for the following.

(1) If brakes are applied suddenly to a moving bus, the passengers lean forward. 1

(2) Aneroid barometer can also be used as altimeter. 1

(3) As the balloon goes up in sky, the buoyancy force goes on decreasing gradually. 1

(4) If a few drops of spirit are placed on the palm, we feel cool. 1

(5) If a burning stick of incense is moved fast in a circle, we see a continuous circle of red light. 1

(6) 'Potential difference' in electricity is analogous to temperature difference in heat. 1

(7) It is dangerous to replace a fuse wire by any other thick wire. 1

(8) A wireman uses a neon detector to detect the phase wire or the neutral wire. 1

Q. 3 (a) Classify the following quantities into vectors and scalars : Mass, acceleration, speed, & velocity. 2

(b) (i) Define 'acceleration'. 1

(ii) A body starts from rest and its velocity goes on increasing continuously. If velocities after 1 sec. and 2 sec. are 4 m/s and 8 m/s respectively, what is the acceleration ? 1

(c) (i) State the principle of conservation of momentum. 1

(ii) Give one example which explains this principle. 1

(d) (i) What do you mean by a 'buoyancy force'? 1

(ii) What is its relation with the weight of a floating body? 1

Q. 4 (a) A car is moving at 10 m/s. When brakes are applied, it comes to a halt in 20 seconds.

(i) Find the uniform acceleration.

(ii) Interpret its negative sign.

(iii) If the mass of the car is 3000 kg. find the average stopping force. 3

(b) (i) What is sublimation? 1

(ii) Name two substances which show sublimation. 1

(c) Two resistances of 1000 ohms and 500 ohms are connected in series with a dry cell of 1·5 volt and a plug key.

(i) Draw a circuit diagram and name the different parts. 1

(ii) Calculate the total series resistance and the current flowing through the circuit. 1

(iii) Calculate the P. D. across the two resistances separately. 1

OR

Q. 4 (a) (i) Define 'Momentum of a body. 1

(ii) A body of mass 800 gm moves with a velocity 5 m/s. Find its kinetic energy in joules. 1

(iii) Define : 'Pressure'. 1

(b) (i) What is 'condensation'? 1

(ii) What can you say about the thermal energy of ice at 0°C and of water at 0°C? 1

(c) (i) What are the important parts of a spectrometer? 1

(ii) What do you mean by 'dispersion' and spectrum'? 2

Q. 5 (a) A stone weighing 75 newton falls under gravity from a height of 20 m.

(i) Find its P. E. at the highest point. 1

(ii) Find its K. E. and velocity when it touches the ground 1

(b) U-tube contains water in it. When air is blown through one arm, the water level in the other arm rises, such that the difference in levels in two arms is 6·8 cm. Find the guage pressure at the top of water column in the arm in which air is blown (Answer in cm of Hg) 2

(c) Draw a diagram and explain Edison effect. 2

(d) When two equal resistances are connected in series, the total resistance is 8 ohms. What would be the total resistance if they are connected in parallel ?

OR

Q. 5 (a) Give three points of difference between boiling and evaporation. 3

(b) (i) Draw a ray diagram to show the defect of longsightedness. 1

(ii) How can this defect be corrected for ? 1

(c) I use two bulbs, one of 40W and other of 60W, daily for 5 hours. If meter reading on 1st April is 3476·8 KWH, find —

(i) meter reading on 1st May, 2

(ii) Cost of electricity consumed at the rate of 32 paise per unit. 1

PAPER 8

Q. 1 (a) Complete the following statements by selecting a proper word or phrase from the given alternatives and rewrite.

(1) The polar co-ordinates of a point M are $(\sqrt{2}, 45^\circ)$. The cartesian co-ordinates of that point M must be —

(a) (1, 2) (b) $(\sqrt{2}, 1)$

(c) $(1, \sqrt{2})$ (d) (1, 1)

(2) A body is moving with an acceleration of $2m/s^2$. Its velocity u at some time instant, will change after 3 seconds, to ..... m/s. 1

(a) [u+2] (b) [u+3]

(c) [u+5] (d) [u+6]

(3) Momentum of a body is independent of — 1

(a) mass (c) acceleration

(b) speed (d) velocity.

(4) Body A of mass 2kg is at a height of 3m from the ground, while another body B of mass 3kg is at a hight of 2m from ground. Therefore — 1

(a) A has more P. E. than B.

(b) B has more P. E. than A.

(c) they have same P. E.

(d) we cannot compare their P. E. so easily.

(5) At any point in a liquid the upward force is.....the downward force. 1

(a) greater than (b) equal to

(c) less than (d) not at all related with

(6) For a floating body, the buoyancy force is ..... the weight of the displaced liquid. 1

(a) less than (b) equal to

(c) greater than (d) independent of

(b) Match the pairs and rewrite them in your answer book.

A	B
(1) Work	(1) Newton
(2) Power	(2) kg metre / second
(3) Force	(3) Joule
(4) Momentum	(4) Metre / second
	(5) kg / second
	(6) Joule / second 2

Q. 2 Give scientific reasons for the following :—

(1) A gymnast can jump 6 times higher on moon than on earth. 1

(2) For a sphere moving on a horizontal table, the work done by the gravitational force is zero. 1

(3) Mercury is the suitable liquid for a barometer. 1

(4) A piece of iron sinks in water but floats on mercury. 1

(5) Food can not be cooked properly at high altitude. 1

(6) A convex lens can not be used to rectify the defect of short-sightedness. 1

(7) Screw-drivers used by wiremen have plastic or wooden handles. 1

(8) If a '5-ampere fuse' is recommended, then it is dangerous to replace it by '15-ampere fuse' 1

Q. 3 (a) In a polar frame of reference, show the following points and their position vectors.

M (6, 50°), N (5, 130°). 2

(b) (i) What is the unit of momentum in MKS system ? 1

(ii) What is meant by 'uniform acceleration' ? 1

(c) State Pascal's law. Give any one application of this law. 2

(d) Describe an experiment to show that the rate of evaporation depends on the surface area. 2

Q. 4 (a) (i) State Newton's Second Law of Motion. 1

(ii) Find the mass of a body if a force of 20 dyne produces an acceleration of 2·5 cm/sec². 1

(b) (i) State two factors (other than the surface area) on which the rate of evaporation depends. 1

(ii) What do you mean by 'latent heat of fusion' and 'latent heat of freezing' ? 2

(c) (i) Draw only a ray diagram for a refracting type of a telescope, label it. 2

(ii) What is a near point ? 1

OR

Q. 4 (a) Show that Newton's First Law of motion is the special case of Newton's Second Law of motion. 2

(b) Draw a diagram and label it, to show the construction of a spectrometer. 2

(c) You have two electric bulbs. You want to connect them with a battery such that there should be a separate switch for each bulb. Draw only a circuit diagram for this arrangement. 2

(d) A 100 W bulb is used on mains supply. (230 volts) Find the resistance of the filament of the bulb. 2

Q(5 (a) Give reasons for the following. 3

(i) Water level does not change, even when a floating block of ice melts completely.

(ii) Porous earthen vessels are used to cool the water.

(iii) A tall tower at a large distance can hide completely behind a man standing near us.

(b) Describe an experiment to show the heating effect of an electric current. 2

(c) (i) How does a neon detector work ? State its use 2

(ii) What is an ' open circuit ' ? 1

OR

Q. 5 (a) Read the passage given below and answer the questions that follow ;—

"The heat energy supplied at the melting point of a solid is utilized to free the molecules from their bonds of attraction. The molecules thus freed become mobile. While a solid melts, the temperature of the liquid so formed is the same as that of of a solid. This means that at this temperature the vibrational energy of a solid is same as the vibrational energy of the liquid. The energy supplied to the solid for melting it, is stored as potential energy of the molecules in the liquid form. Hence a substance possesses more thermal energy in its liquid form than in solid form at the same temperature. "

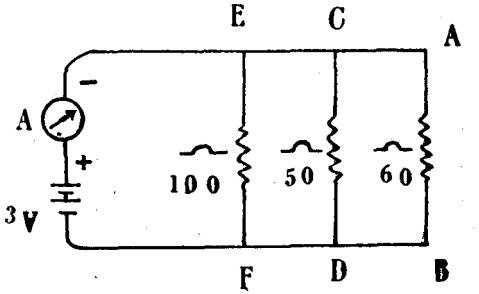
(1) How is the heat energy utilized, when supplied during the melting process ?

(2) Which of the following two factors determines the vibrational energy of a substance ? State of substance; and temperature of the substance.

(3) State the form in which heat energy is stored during a melting process.

(4) We have 1 gm of ice at 0°C and 1 gm of water at 0°C (i) Which of the two will have move thermal energy ? (ii) Which of the two will have more vibrational energy ? 4

(b) Observe the circuit digram & answer the questions Find the current through—



(i) the branch AB,
(ii) the branch CD,
(iii) the branch EF and
(iv) through the ammeter. 4

(Fig. Paper 8·1)

PAPER 9

Q. 1 (a) Complete the following statements by selecting a proper word or phrase from the given alternatives and rewrite the completed statements.

(1) A person is swimming in a river against the water current. This involves — 1

(a) vector subtraction of non-collinear vectors.
(b) vector addition of non-collinear vectors.
(c) vector addition of collinear vectors.
(d) vector subtraction of collinear vectors.

(2) The example of purely rotational motion is —

(a) the man in a moving car.
(b) wheels of a moving car.
(c) a gramophone record (disc) when in use.
(d) pendulum of a wall clock. 1

(3) The rifle recoils when a bullet is fired. This is explained by — 1

(a) Newton's First Law of motion.

(b) Newton's Second Law of motion.

(c) Newton's Third Law of motion.

(4) Hydraulic press is based on — 1

(a) Archimedes' principle.

(b) Pascal's law.

(c) the fact that liquids seek their own level.

(d) the fact that the pressure increases with depth in a liquid.

(5) When an ice block floating on water melts completely the water level — 1

(a) will increase.

(b) will decrease.

(c) will remain the same.

(6) Current flow in metals is due to — 1

(a) thermions. (b) ions.

(c) holes. (d) free electrons.

(7) Match the pairs and rewrite them in your answer-book. 2

(i) A person is swimming in a river against the water current.	(a) This involves vector subtraction of non-collinear vectors.
(ii) A boat is moving in a river with the water current.	(b) This involves vector addition of non-collinear vectors.
(iii) A person is walking on the pavement of a wall clock.	(c) This involves vector addition of collinear vectors.
(iv) A person is walking on the floor of a moving car.	(d) This involves vector subtraction of collinear vectors.

(8) Two points P and Q are such that.. (Two points)

(1) P (4, 40°) Q (8, 220°)	(1) P and Q occupy same position.
(2) P (9, 30°) Q (7, 30°)	(2) P and Q are distinct points but are equally distant from origin.
(3) P (9, 20°) Q (9, 38°)	(3) P lies between origin & Q.
(4) P (8, 10°) Q (18, 10°)	(4) Origin lies between P & Q.
	(5) Q lies between origin & P.
	(6) One of them coincides with origin.

Q. 2 (1) A body is released from a certain height. Find its velocity after 1 second, if $g = 9{\cdot}8$ m/s². 1

(2) A body of mass 500 gm moves with a velocity 2 m/s. Find its kinetic energy in joules. 1

(3) In Hare's apparatus, a water column of height 12·5 cm is balanced by a glycerine column of height 10 cm. Find the density of glycerine. 1

(4) A wooden block of 0·1 kg floats on mercury. Find the buoyancy force in newton. 1

(5) Find the heat given out when 1 gm of steam sa 100°C is converted into water at 40°C. 1

(6) Find the power of a convex lens which has a focal length of 20 cm. 1

(7) A charge of 0·5 coulomb crosses a given cross-section of a wire in 2 seconds. Find the current. 1

(8) Meter reading 4437·5 KWH changes to 4447·5 KWH. Find the energy cost, at the rate of 30 paise per unit. 1

Q. 3 (a) A force $\vec{F}$ acts on a body of mass m and changes its velocity from $\vec{u}$ to $\vec{v}$ in time t. Find—

(i) the initial momentum of the body.

(ii) the final momentum of the body.

(iii) the change in momentum of a body, and

(iv) the rate of change in momentum. 2

(b) (i) State Pascal's law of transmission of pressure. 1

(ii) Describe briefly the experiment to demonstrate this law. 2

(c) (i) What is ' latent heat of fusion of ice ' 1

(ii) Describe an experiment to determine the latent heat of fusion of ice. 2

Q. 4 (a) (i) State Newton's Third Law of motion. 1

(ii) State one example which explains this law. 1

(b) (i) Whal is meant by the apparent size of an object? 1

(ii) Draw only a diagram to show the change in the apparent size when an object is moved towards the eye. 1

(c) (i) Name the different parts of a spectrometer. 1

(ii) State why the prism table is provided with levelling screws. 1

(d) (i) Draw only a diagram of the experimental arrangement used to show the heating effect of an electric current. Name the different parts. 1

(ii) How is this effect made use of in 'fuse wire'? 1

OR

Q. 4 (a) A body of mass 100 gm is moving with a velocity of 40 cm/s. When a force of 200 dyne acts on it for 40 seconds, its velocity will incrase. Find this final velocity. 2

(b) (i) State Boyle's law. 1

(ii) Describe an experiment to verify this law. 2

(c) (i) Explain the Anomalous Behaviour of water with Hope's apparatus. 2

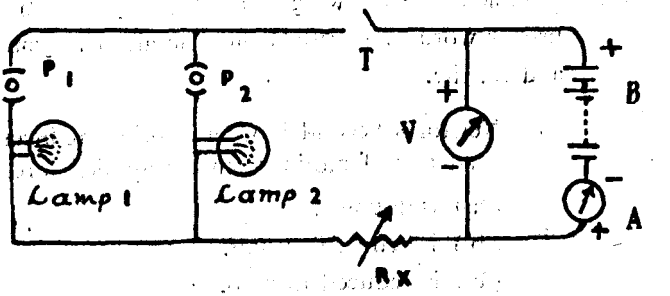
(ii) Draw a neat diagram of Hope's apparatus. 1

Q. 5 (a) (i) How is boiling point affected by pressure? 1

(ii) State one application of this effect. 1

(b) State the functions of (i) ciliary muscles and (ii) iris. 2

(c) Observe the circuit diagram given below and answer the questions that follow.



(Fig. Paper 9·1)

(1) Name the parts—

(i) P_1 (ii) T (iii) Rx (iv) B

(2) How can we switch off both the lamps simultaneously ?

(3) Why is it not possible to measure the current flowing through lamp 1 alone ?

(4) How can we change the current passing through the circuit ?

OR

Q. 5 (a) (i) State the low of floatation. 1

(ii) What are the different types of emission spectra ? 1

(iii) Name one insulator and one semiconductor. 1

(b) State two points of difference between a series connection and a parallel connection of resistances regarding current and voltage. 2

(c) (i) What is a 'phase wire' ? 1

(ii) How does a neon detector work ? 2

PAPER 10

Q. 1 (a) Complete the following statements by selecting a proper word or phrase from the given alternatives and rewrite.

(1) Newton's Second Law of motion reduces to First law of motin when the applied force—

(a) is doubled.

(b) is reduced to half.

(c) is reduced to zero.

(d) is kept constant. 1

(2) An engine A does a work W in time t. Another engine B does a work 2 W in half the the time. So the power of engine B must be—

(a) half the power of A.

(b) twice the power of A.

(c) four times the power of A.

(d) 1/4th of the power of A. 1

(3) At any point in a liquid, the upward force is ....the downward force.

(a) greater than (b) less than

(c) equl to. 1

(4) An air bubble rises above from the bottom of the water tank. Its size—

(a) increases (b) decrease (c) remains constant. 1

(5) For substances which contract on melting (such as ice) ;— 1

(a) melting point decreases with increasing pressure.

(b) melting point increases with increasing pressure.

(c) melting point is independent of pressure.

(d) melting point decreases with decreasing pressure.

(6) An eye-lens forms on the retina an image which is— 1

(a) real, inverted and diminished.

(b) real, erect and diminished.

(c) virtual, inverted and magnified.

(d) virtual, erect and magnified.

(b) Unit in group A is equivalent to some expression in group B. Match the pairs and rewrite in your answer book.

A	B
(i) Erg	(1) 746 watts.
(ii) Joule	(2) 10^6 dynes.
(iii) Watt	(3) Newton metre.
(iv) HP	(4) Kg metre/second.
	(5) Joule/second.
	(6) Dyne cm. 2

Q. 2 Give scientific reasons for the following.

(1) The boat moves back when we jump out of it. 1

(2) City supply water reservoirs are constructed at the highest place in city. 1

(3) A body immersed in a liquid appears to be light. 1

(4) Most of the salts have high melting points. 1

(5) A concave lens can not be used to rectify the defect of long-sightedness. 1

(6) Wet clothes can be dried earlier in open air than in rooms. 1

(7) A hydrometer sinks more in lighter liquids. 1

(8) Same 5-ampere fuse can not be used for both — an electric bulb of 40 W and a heater of 1500 W. 1

Q. 3 (a) The polar co-ordinates of points M and N are— M (6, 40°) and N (8, 130°). 3

(i) Show the position vectors $\vec{OM}$ and $\vec{ON}$.

(ii) Show the vector $\vec{OM} - \vec{ON}$.

(iii) Measure the magnitude of the vector $\vec{NM}$.

(b) Three cyclists A, B, C, have their constant velocities 5 m/s, 6 m/s and 7 m/s respectively. If they are moving along same straight road towards same target,— 2

(i) Find the velocity of C relative to A.

(ii) Find the velocity of A relative to B.

(iii) Find the velocity of C relative to B.

(iv) Find the velocity of A relative to C.

(c) Describe an experiment to determine the density of a liquid which is not immiscible in water. 2

(d) State the function of ' iris ' in an eye. 1

Q. 4 (a) (i) State Newton's First law of motion. 1

(ii) State one example to explain this law. 1

(b) (i) What is the effect on the boiling point of a liquid when some soluble substance is added to it ? 1

(ii) Describe a simple experiment to demonstrate this effect. 2

(c) Draw only diagrams to show —

(i) the defect of short-sightedness

(ii) how this defect of short-sightedness can be corrected. 2

(d) State the use of ' earth ' wire in a three-pinplug. 1

OR

Q. 4 (a) A marble of 25 gm is moving at 8 cm/s. A force acts on it for 10 seconds and changes its speed to 40 cm/s. 3

(i) Find the initial momentum of the marble.

(ii) Find the final momentum of the marble.

(iii) Find the rate of change of momentum.

(iv) What must be the magnitude of the force ?

(v) State the law that you have used in this example.

(b) (i) State Archimedes' principle. 1

(ii) A wooden block of mass 40 gm. floats on water. What is the volume of water displaced ? 1

(c) Draw a diagram, and explain the experiment to demonstrate the heating effect of an electric current. 1

Q. 5 (a) (i) State the principle of conservation of momentum. 1

(ii) Write down the potential energy of a mass m, situated at a height h above ground. 1

(b) (i) What is the difference between ' amorphous ' and ' crystalline ' substances ? 1

(ii) What is ' the latent heat of vaporization ' ? 1

(c) (i) Find the electrical energy consumed if I use a 40 W table lamp, daily for 3 hours and a tube lamp of 40 W daily for 5 hours. (for the month of April), 1

(ii) Find the meter reading at the end of the month if the initial reading was 7539·6 KWH. 1

(iii) Find the cost of electricity at 30 paise per unit. 1

(d) Name two sources which give continuous spectra. 1

OR

Q. 5 (a) (i) State the principle used in pressure cookers. 1

(ii) What is sublimation ? 1

(b) Draw a diagram to show the construction of the spectrometer. Name the different parts. 2

(c) Read the following paragraph and answer the questions that follow. 4

" Substances such as silicon and germanium, are neither good conductors of electricity nor good insulators. They are called semi-conductors. They have a small number of free electrons and can therefore produce only a small amount of electric current. However, on addition of a small amount of suitable material the conductivity of the semiconductor is markedly affected. The semiconductor is then called as ' impurity semiconductor '. For example, when several arsenic atoms are added to a silicon crystal, we get an n–type semiconductor. It is so called because a large number of free electrons can carry the electric current. But when gallium atoms are added to a silicon crystal, in the resulting structure there are vacancies for electrons. These vacancies are called ' holes ', which effectively have a positive charge. On applying a P. D. electrons move, causing movement of holes in opposite direction. So the holes are the current carriers in such a semiconductor called a p–type semiconductor. Such semiconductors are used to prepare transistors.

(1) What are semiconductors ?

(2) How can the conductivity of a semiconductor be changed ? Give an example.

(3) What are current carriers in n–type and in p–type semiconductors ?

(4) State the application of semiconductors.

PAPER II

Q. 1 (a) Complete the following statements by selecting a proper word or phrase from the given alternatives, and rewrite.

(1) Point M is (3, 4). The magnitude of the position vector OM must be 1

(a) 12 (b) 5 (c) 7 (d) 25

(2) The unit of acceleration in M.K.S. system is—

(a) newton. (b) metre/second.

(c) metre/second² (d) joule. 1

(3) If ' u ' is the initial velocity and ' a ' the acceleration then velocity after 1 second must be 1

(a) (u+a) (b) (u-a) (c) (a-u) (d) (a+u)

(4) Kinetic energy of a body is independent of 1

(a) mass of the body.

(b) velocity of the body.

(c) speed of the body.

(d) direction of motion of the body.

(5) For any floating body, loss in weight is 1

(a) less than the weight of the body.

(b) equal to the weight of the body.

(c) greater than the weight of the body.

(6) Example of an amorphous substance is — 1

(a) water; (b) iron;

(c) common salt; (d) borax.

(b) Match the pairs and rewrite them in your answer-book. 2

A	B
(i) Hydraulic press	(1) Dispersion
(ii) Motion pictures	(2) Magnetic effect of electric current.
(iii) Fuse wire	(3) Pascal's law,
(iv) Solenoid	(4) Archimedes' principle
	(5) Persistence of vision
	(6) Heating effect of electric current.

Q. 2 Give scientific reasons for the following.

(1) Dam walls are constructed to be broader at the base. 1

(2) Density figures on a hydrometer are decreasing towards the upper end. 1

(3) Rate of evaporation increases with temperature. 1

(4) In cold countries pipes carrying water burst. 1

(5) Discrete photographs can give a continuity in motion pictures. 1

(6) Levelling of prism table is necessary in an experiment with a spectrometer. 1

(7) A compass needle gets deflected when taken near a current carrying conductor. 1

(8) House wiring can not use series combination of different electrical devices. 1

Q. 3. (i) Write the cartesian co-ordinates of a point P(4, 90°) 1

(ii) A train at rest, starts moving with an acceleration of 2 m/s^2. Find its velocity after 4 seconds. 1

(iii) Find the weight of a man on the moon if his mass is 60 kg. Write the answer in newton. 1

(iv) Find the kinetic energy in joules for a mass of 100 gm moving at 10 m/s. 1

(v) In Hare's apparatus, a glycerine column of height 16 cm is balanced by a kerosene column of height 25 cm. If density of glycerine is 1·25 gm/cm^3, find the density of kerosene.

(vi) A wooden block is half submerged under water. Find its density. 1

(vii) Calculate the heat gained by 2 gm of ice ot 0°C. when converted into 2 gm of water at 26°C. 1

(viii) Find the current flowing through a resistance of 60 ohms, if P. D. across its terminals is 1·5 volt. 1

Q. 4. (a) (i) What is the difference between vectors and scalars ? 1

(ii) What is meant by ' uniform acceleration '? 1

(iii) What is meant by ' Inertia ' of a body ? 1

(iv) What is the cause of kinetic energy ? 1

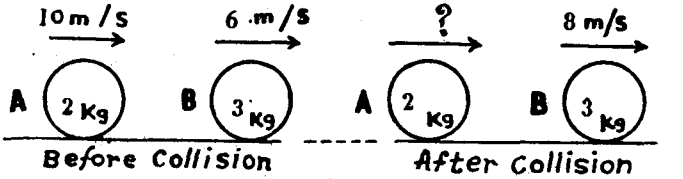
(v) Define : Pressure. 1

(b) (i) What is the effect of pressure on boiling point?

(ii) Describe a simple experiment to explain this effect. 2

OR

Q. 4. (a) From the figure shown below, answer the given questions.



(Fig. Paper 11·1)

(i) Find the initial momentum of A.
(ii) Find the initial momentum of B.
(iii) Find the final momentum of B.
(iv) Hence find final momentum of A.
(v) Find final velocity of A.
(vi) State the principle involved. 3

(b) (i) What is 'latent heat of fusion of ice'? 1
(ii) Describe an experiment to determine it. 2

(c) State the use of :—
(i) neon detector, (ii) Fuse. 2

Q. 5. (a) (i) State Newton's second law of motion. 1
(ii) How can an elephant be weighed? 1
(iii) State the relation between C.G.S. and M.K.S. units of work. 1
(iv) State Pascal's law. 1
(v) State Ohm's law. 1

(b) (i) Draw a diagram to show the defect of long sightedness. 1
(ii) Draw a diagram to show how it can be corrected. 1

(c) What is a 'near point'? 1

OR

Q. 5 (a) Describe an experiment to verify Archimedes' principle. 2

(b) Describe an experiment to study the effect of surface area on the rate of evaporation. 2

(c) What adjustments are necessary before we use a spectrometer? 2

~~(d) Describe an experiment to study the heating effect of an electric current.~~ 2

PAPER 12

Q. 1 (a) Complete the following statements by selecting a proper word or phrase from the given alternatives, and rewrite. 1

(1) A man crosses the river from one bank to the other. This involves —

(a) vector subtraction of two collinear vectors.

(b) vector addition of non-collinear vectors.

(c) vector addition of collinear vectors.

(d) vector subtraction of non-collinear vectors.

(2) When a force of 1 Newton acts on a body and displaces the body through a distance of 1 metre in the same direction, the work done is—

(a) 1 Erg (b) 1 Watt

(c) 1 Joule (d) 1 Dyne. 1

(3) Mass multiplied by rate cf change of velocity gives —

(a) Force (b) Acceleration

(c) Momentum (d) Work 1

(4) A moving body reduces its speed to half as it comes from point A to point B. ∴ K.E. at B must be .... K.E. at A.

(a) eqal to (b) 1/4th of

(c) 4 times (d) 1/2 of

(5) Pressure at some point in liquid —

(a) acts only upward. (b) acts only downward.

(c) acts sideways. (d) acts in all directions.

(6) Flow of current through a wire between two points depends upon —

(a) potential. (b) potential difference.

(c) temperature. 1

(b) Match the pairs and rewrite them in your answer book. 2

A (example)	B (Type of motion)
(i) Wheels of a moving car	(1) Only rotational.
(ii) Man in a moving car.	(2) Only vibrational.
(iii) Gramophone disc (being played)	(3) Only translational.
(iv) Pendulum of a wall clock.	(4) Rotational + translational.
	(5) vibrational + rotational.

Q. 2 (a) (i) State Newton's Second law of motion. 1

(ii) A force F acting on a mass of 50 gm for 3 seconds changes its velocity from 4 cm/s to 10 cm/s. Find —

(a) change in momentum.

(b) force F in dyne.

(b) (i) What is meant by an 'amorphous substance'? 1

(ii) What can you say about the temperature during the melting process of an amorphous substance? 1

(c) Draw a diagram and describe Edison Effect. 3

Q. 3 (a) (i) State Archimedes' principle. 1

(ii) State the factor which determines whether a body will sink in a liquid or float on it. 1

(b) Draw a ray diagram of a refracting type of telescope. 2

(c) Describe an experiment to demonstrate the magnetic effect of an electric current. 1

(d) (i) State the principle used in a 'fuse' 2

(ii) What do you mean by a '15–ampere fuse'? 1

Q. 4 (a) Give reasons for the following.

(1) Water rushes out as soon as we open the tap. 1

(2) Thermal energy of water at 0°C is more than the thermal energy of ice at 0°C. 1

(3) The objective of telescope has a large aperture. 1

(4) In any electrical experiment, it is always to advisable use a key in series with a battery. 1

(b) A stone of 1 kg is released from a height of 4·9 m. above ground, 3

(1) Find its potential energy at the highest point, and its K. E. when it touches the ground.

(2) Find its velocity when it strikes ground.

(3) State the principle involved.

(c) A resistance of 60 ohms is connected to a cell of 1·5 volt. Find the current through the circuit. 1

OR

Q, 4 (a) Give reasons for the following.

(1) As the balloon goes upward the buoyancy force goes on decreasing. 1

(2) 20 cm^3 of water in a saucer evaporates out before equal volume of water in a cup evaporates. 1

(3) Two ice blocks can be pressed together to form a single block. 1

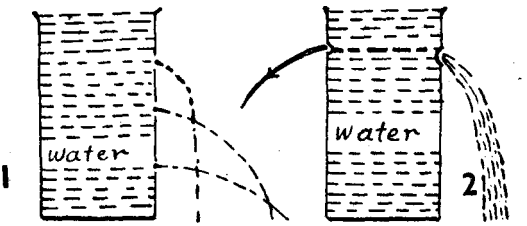
(4) Defects of sight are mostly due to inability of ciliary muscles to function. 1

(b) Draw a diagram to show the construction of a spectrometer. Name the different parts. 2

(c) (i) Why is it advisable to use a three-pin plug for a table-fan or an electric iron? 1

(ii) State the use of a neon-detector. 1

Q. 5 (a) What do the following two figures suggest? 1



(Fig. Paper 12·1)

(b) (i) Draw a diagram showing the experimental arrangement for 'the determination of latent heat of vaporization of water.

(ii) Name the parts in the diagram.

(iii) What is the use of steam-trap? 3

(c) (i) What is short-rightedness ? 1

(ii) How can it be corrected? 1

(d) What is presbyopia due to ? 1

OR

Q. 5 (a) If $\vec{a}$ and $\vec{b}$ are two non-collinear vectors having same magnitude show

(i) $(\vec{a} + \vec{b})$ and

(ii) $(\vec{a} - \vec{b})$

(b) (i) What is ' inertia ' ? 1

(ii) State Newton's Law of motion concerned with inertia. 1

(iii) Define ' Joule ' 1

(c) A caloriemeter together with a stirrer has a mass of 100 gm. It contains 50 gm of water at 25°C. When steam is passed through it, the temperature rises to 72°C. At the end of the experiment, the caloriemeter weighs 155 gm with all its contents. If specific heat of caloriemeter is 0·1 cal/gm°C

(i) Find the mass of steam converted into water;

(ii) Find the heat gained by cold water,

(iii) Find the heat gained by the caloriemeter,

(iv) Find the heat given out by water formed of steam while cooling from 100°C to 72°C,

(v) Find the heat given out by steam during condensation, and

(vi) Find the latent heat of vaporization of water. (Temperature of steam 100°C) 3

PAPER 13

Q. 1 (a) Complete the following statements by selecting a suitable word or phrase from the given alternatives and rewrite.

(1) The polar coordinates of a point M are $(4, 135^\circ)$. The cartesian coordinates of this point must be—

(a) $[2\sqrt{2}, \ 2\sqrt{2}]$ (b) $[2, \ 2]$

(c) $[-2\sqrt{2}, \ 2\sqrt{2}]$ (d) $[-2, 2]$

(2) The motion of a particle moving along a circular path with constant speed is accelerated motion because—

(a) its speed is constant.

(b) its velocity is constant.

(c) it is at same distance from centre of circle.

(d) its direction changes though speed is constant. 1

(3) A man of mass 60 kg lands on moon. His weight on moon will be—

(a) 68 newton (b) 10 kg

(c) 360 kg (d) 588 newton. 1

(4) Work done by a force depends—

(a) only on the magnitude of force.

(b) on magnitude of force and direction of displacement.

(c) on the magnitudes of force and displacement.

(d) on magnitudes and directions of force & displacement. 1

(5) Latent heat of vaporizatin of water is..cal/gm

(a) 980 (b) 80 (c) 540 (d) 746 1

(6) In our eye,.... is the part sensitive to light.

(a) retina (b) cornea

(c) choroid (d) iris. 1

(b) Match the pairs and rewrite them in your answer-book.

A (Physical Quantity)	B (Unit)
(i) Work	(1) metre/second^2
(ii) Acceleration	(2) Newton
(iii) Force	(3) kg. metre/second
(iv) Momentum	(4) Joule
	(5) metre/second
	(6) Dyne/cm^2

Q 2. (1) What is the difference between vectors and scalars ? 1

(2) What do you mean by ' uniform acceleration ' ? 1

(3) State Newton's Third Law of motion. 1

(4) Define the unit of work in M. K. S. system. 1

(5) State Boyle's Law. 1

(6) What is ' latent heat of freezing of water ' ? 1

(7) State the function of optic nerves in an eye. 1

(8) What is a p-type semiconductor ? 1

Q. 3 (1) Find the magnitude of the vector $\overrightarrow{MN}$ if the points are M (6, 20°) and N (8, 110°). 1

(2) A body at rest released from a certain height. If $g = 9{\cdot}8\ m/s^2$, find the velocity of the body after 2 seconds. 1

(3) A body of mass 2 kg. moves with a velocity of 50 cm/second. Find its momentum. 1

(4) Find the work done, in 5 seconds, by an engine of power 2 watts. 1

(5) The height of water column in Hare's apparatus is 8 cm. Find the density of kerosene in other arm if height of kerosene column is 10 cm. 1

(6) Find the weight of water displaced by a wooden block of mass 1 kg. floating on water. 1

(7) Find the heat gained by 1 gm of ice at 0°C when it is converted into 1 gm of water at 25°C. 1

(8) Find the power of a convex lens which has a focal length of 40 cm. 1

Q. 4 (a) According to Aristotal, ' A constant force is required for a steady motion ', Is this statement correct ? Why ? 2

(b) Three identical beakers are there.

Beaker →	A	B	C
Liquid →	Water	Kerosene	Glycerine
Height in cm. →	12	10	8
Density in gm/cm^3 →	1·0	0·8	1·25

(i) Which of the three beakers experiences maximum pressure on its base ? Why ? 1

(ii) Which will experience minimum pressure on its base ? Why ? 1

(c) (i) What is sublimation ? 1

(ii) Name two substances that sublime. 1

(d) (i) What is ' persistence of vision ' ? 1

(ii) State any one application of this effect. 1

OR

Q. 4 (a) (i) What is ' potential energy of a system ' ? 1

(ii) Give two examples of potential energy. 1

(b) Name four factors on which rate of evaporation depends. 2

(c) (i) What is the effect of pressure on boiling point ? 1

(ii) Describe an experiment which demonstrates this effect. 2

(iii) Draw a necessary diagram. 1

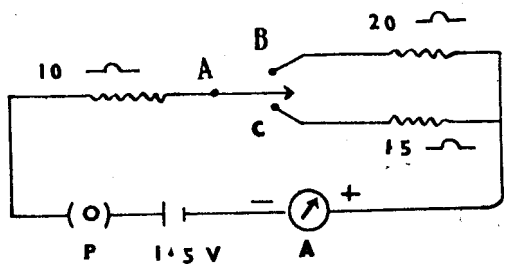
Q. 5 (a) A force of 2 newton acts on a body of mass 2 kg. for 2 seconds. If the initial velocity of the body is 2 m/s, find the final velocity. 2

(b) A boy can lift a load of 75 newton in air. What is the maximum weight of the stone that he will be able to lift if it is immersed in water ? (Given that density of stone is 4×10^3 kg/m^3). Find the weight of stone in air. 2

(c) (i) Name two sources which give continuous spectra.

(ii) Describe how a solar spectrum appears.

(d) Observe the circuit diagram and answer the questions.



(Fig. Paper 13·1)

(i) Calculate the current flowing through the ammeter if A is connected to B.

(ii) Calculate the current if A is connected to C. 1

OR

Q. 5 (a) (i) Give two points of difference between boiling and evaporation.

(ii) What can you say about vibrational energy of ice at 0°C and of water at 0°C ? 1

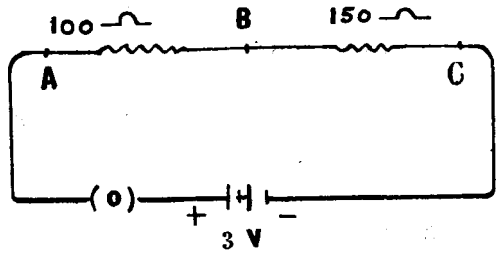
(b) Find the cost of electrical energy consumed (at the rate of 35 paise per unit) when the following devices are used for 30 days of a month.

(i) 40 W bulb, daily for 2 hours,

(ii) 60 W bulb, daily for 2 hours, and

(iii) 1000 W electric heater, daily for 15 minutes. 3

(c) Observe the following circuit diagram, and answer the questions.



(Fig. Paper 13·2)

(i) Find the current flowing through the circuit. 1

(ii) Find the P.D. between A and B. 1

(iii) Find the P.D. between B and C. 1

PAPER 14

Q. 1 (a) Complete the following statements by selecting a suitable word or phrase from the given alternatives and rewrite.

(1) The points P (4, 40°) and Q (8, 220°) are such that—

(a) Q lies between origin and P.

(b) origin lies between Pand Q.

(c) P lies between origin and Q.

(d) they occupy the same position. 1

(2) The rifle which has a mass much greater than the mass of the bullet, recoils with—

(a) same speed as that of the bullet.

(b) greater speed than the bullet.

(c) less speed than the bullet.

(d) very high speed. 1

(3) 1 newton = ... dynes.

(a) 10^3 (b) 10^4 (c) 10^5 (d) 10^7 1

(4) In M.K.S. system, ... is the unit of work done. 1

(a) erg (b) watt (c) joule (d) HP

(5) A wooden block is floating on water. The temperature of water is raised from 25°C to 40°C. Hence —

(a) the block will sink more than before.

(b) the block will sink less than before.

(c) the block will sink same as before.

(d) the block will sink completely. 1

(6) For substances which expand on melting (such as wax), —

(a) melting point decreases with increasing pressure.

(b) melting point increases with increasing pressure.

(c) melting point is independent of pressure.

(d) melting point increases with decreasing pressure. 1

(b) Match the pairs and rewrite them.

(Part) A	(Function) B
(i) Iris	(1) Changing the focal length of eye lens.
(ii) Sclerotic	(2) Communicating the knowledge of the image formed on retina.
(iii) Cornea	(3) Changing the size of the pupil.
(iv) Optic nerves	(4) Being a hard fibrous layer, protecting the eyeball.
(v) Retina	
(iv) Ciliary muscles	

2

Q. 2 (1) What are vector quantities ? 1

(2) What do you mean by ' unform acceleration ' ?

(3) Define momentum of a body. 1

(4) Write down the kinetic energy of a body of mass m moving with velocity v. 1

(5) What is meant by ' one atmosphere pressure ' ? 1

(6) State Boyles' law. 1

(7) What is ' anomalous behaviour of water ' ? 1

(8) State the use of ' simple microscope ' 1

Q. 3 (a) How will you demonstrate 'dispersion' from sunlight ? 2

(b) Explain the current flow taking place in a p-type semiconductor. 2

(c) What are the symbols used for a cell, a plugkey, a tap key and a variable resistance. 2

(d) (i) What will happen if a fuse wire is replaced by a thick wire ? 1

(ii) What will happen if all the domestic electrical devices are connected in series, instead of connecting them in parallel ? 1

Q. 4 (a) (i) Show the point P (4, 3) in a cartesian frame of reference. 1

(ii) Measure the angle θ and express it in the polar form. 1

(b) (i) State Newton's Third Law of motion. 1

(ii) Give one example to explain this law. 1

(c) Describe an experiment to explain how the rate of evaporation depends on surface area. 2

(d) Calculate the current flowing through a 60 W bulb when connected to mains supply of 230 V. Also calculate the resistance of the filament of the bulb. 2

OR

Q. 4. (a) A body of mass 2 kg starts from rest and starts moving with uniform acceleration of 3 m/s^2. Find the velocity of the mass after 2 seconds. 2

(b) (i) Find the kinetic energy of the body in above problem. 1

(ii) Find the velocity of that body if K.E. becomes 81 joules. 1

(c) (i) State Pascal's law. 1

(ii) Draw only a diagram of the apparatus which demonstrates this law. 1

(d) Find the total resistance when three resistances each of 300 ohms are connected —

(i) in series and (ii) in parallel. 2

Q. 5. (a) Give reasons for the following.

(1) A boat moves baek when we jump out from it.

(2) A convex lens can not be used for correcting the defect of short sightedness.

(3) Levelling screws are provided to the prism table of a spectrometer.

(4) A fuse wire creates an open circuit for a high value of current. 4

(b) Describe an experiment to determine the ' latent heat of fusion of ice '. 2

(c) Show a circuit diagram when we want to connect three bulbs to a dry cell, so that two bulbs can be switched on simultaneously, but independent of the third bulb. 2

OR

Q. 5. (a) (i) What is ' inertia ' of a body ? 1

(*ii*) State the application of semiconductors. 1

(b) Describe an experiment to determine the density of glycerine with Hare's apparatus. 2

(c) (i) When do we say that air is saturated with water vapour ? 1

(ii) What is a freezing mixture ? 1

(iii) What is latent heat of vaporization ? 1

(iv) State two examples of amorphous substances. 1

PAPER 15

Q. 1. (a) Complete the following statements by selecting an appropriate word or phrase from among the given alternatives, and rewrite them.

(1) The two vectors $\vec{XY}$ and $\vec{YX}$ are such that—

(a) they are equal.

(b) they have same magnitude but have oppsite directions.

(c) they have same direction but have different magnitudes.

(d) they have different magnitudes and opposite directions. 1

(2) A stone weighing 588 newtons on earth will weigh—

(a) 98 newtons on moon.

(b) 588 newtons on moon.

(c) 3528 newtons on moon.

(d) 294 newtons on moon.

(3) The kinetic energy of a moving body is independent of —

(a) the mass of the body.

(b) the speed of the body.

(c) the velocity of that moving body.

(d) the direction of motion of the body. 1

(4) Hydraulic press is based on —

(a) Archimedes' principle.

(b) the fact that liquid seeks its own level.

(c) the fact that pressure increases with depth.

(d) Pascal's law.

(5) A wooden Plank of thickness 3 cm floats on water and half of its thickness is submerged under water. The density of wood must be —

(a) 3 gm/cm^3 (b) 0·5 gm/cm^3

(c) 1·5 gm/cm^3 (d) 1 gm/cm^3

(6) Information of the image formed on the retina of the eye, is communicated to the brain by—

(a) sclerotic. (b) cornea.

(c) optic nerves. (d) pupil.

(b) Group A gives four physical quantities. The group B gives some units in M.K.S. system. Select the appropriate unit for each quantity and rewrite the matched pairs.

Group A :— Acceleration, Work, Force, Electric Current.

Group B :— Volt, Newton, Joule/second, metre/second^2, Joule, Ampere.

Q. 2 (a) (i) How are vectors different from scalars ? 1

(ii) Give one example of each. 1

(b) ' Concept of motion is relative to observer '. Explain giving a suitable example. 2

(c) (i) State Newton's Second Law of motion. 1

(ii) Show that it reduces to First Law when the applied force is zero.

(d) (i) What do you mean by ' guage pressure ' 1

(ii) State the relation between the 'guage pressure' and ' absolute pressure ' at a given point in a liquid. 1

Q. 3 (a) (i) What is ' latent heat of fusion of ice ' ? 1

(ii) Why is it called ' latent ' ? 1

(b) (i) What is 'power of a lens' ? 1

(ii) How is it related to 'focal length' of a lens ?

(c) (i) What do you mean by a 'p-type semiconductor '? 1

(ii) What are the current carriers in p-type and n-type semiconductors ? 1

(d) (i) State Ohm's Law. 1

(ii) State the equation of Ohm's law. Explain the symbols used in this equation. 1

Q. 4 (a) Give reasons for the following.

(i) It is dangerous to alight from a moving train. 1

(ii) Size of an air bubble increases, as it moves upward. 1

(iii) After standing in sun for some time, if we enter our room, we can not see the objects clearly. 1

(iv) It is dangerous to replace a fuse wire by a thick wire. 1

(b) A '2·5 HP engine' works for 10 seconds. Find the work done in joules. 2

(c) Calculate the latent heat of fusion of ice if 6 gm of ice at 0°C can be converted into 6 gm of water at 10°C, by supplying 900 calories of heat. 2

OR

Q. 4 (a) Give scientific reasons for the following :— 4

(1) Lead balls are filled at the bottom of a hydrometer.

(2) In pressure cookers, food can be prepared earlier.

3) Concave lens can not be used for correcting the defect of long sightedness.

(4) Earthing is necessary for instruments which draw high current.

(b) Draw a diagram to show the construction of a spectrometer. Name the different parts. 2

(c) With a diagram, describe Edison Effect. 2

Q. 5 (a) A car is-moving at the speed of 12 m/s. When brakes are applied to it, it comes to halt in 18 seconds.

(i) Find the uniform acceleration.

(ii) If the mass of the car is 2700 kg, find the average stopping force. 2

(b) (i) What is meant by a 'buoyancy force'? 1

(ii) Find the buoyancy force in newtons, for a wooden block of mass 800 gm floating on water. 1

(c) Describe a simple experiment to demonstrate the effect of pressure on boiling point. 2

(d) A student uses in his room a tube lamp of 40 W and a table lamp of 60 W. If the mains voltage is 230 Volts, find— 2

(i) the current drawn by a tube lamp.

(ii) the current drawn by a table lamp.

OR

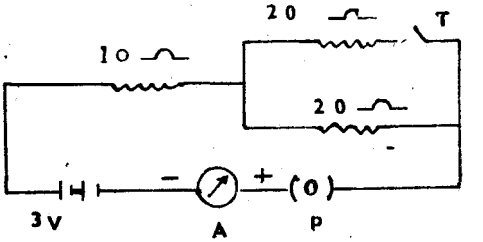
Q. 5 (a) Using $s = ut + \frac{1}{2} at^2$, for a freely falling body, find—

(i) distance travelled in 5 seconds.

(ii) distance travelled in 5th second. 2

(b) Draw a graph (not necessarily to scale), only to indicate the change in volume of a given mass of water, when it freezes. (Assume the initial temperature of water is 10°C.)

(c) Observe the following circuit diagram and answer the questions below it. 4



(Fig. Paper 15·1)

(i) Find the total resistance in the circuit when the keys T and P are both closed.

(ii) Find the current flowing through the ammeter in this situation.

(iii) Calculate the total resistance in the circuit when the key P is closed but T is open.

(iv) Calculate the current in this second situation.

PAPER 16

Q. 1 (a) Complete the following statements by selecting an appropriate word or phrase from among the given alternatives and rewrite.

(1) The cartesian co-ordinates of a point M are given by M (0, 5). The polar co-ordinates of the same point M must be—

(a) [0, 5°] (b) [5, 90°]

(c) [5, 180°] (d) [5, 0°] 1

(2) ' Joule / second ' is the unit of....

(a) electric current (b) work

(c) power (d) energy. 1

(3) For many reasons,.... is found to be the most suitable liquid for a barometer.

(a) water (b) glycerine

(c) mercury 1

(4) A body of mass 1 kg floats on water. The buoyancy force acting on this body has the magnitude—

(a) 1 kg (b) 1 newton

(c) 9·8 newton (d) 980 dyne. 1

(5) When forces of attraction between liquid molecules are stronger, the rate of evaporation—

(a) is relatively low.

(b) is relatively high.

(c) remains the same. 1

(6) The apparent size of the object—

(a) depends only on the distance of the object from eye.

(b) depends only on the size of the object.

(c) depends on size and also on the distance of that object from the eye.

(d) is always constant. 1

(b) Match the pairs and rewrite them in your answer-book.

A (Physical Quantity)	B (Measuring Instrument)
(1) Potential difference	(i) Hydrometer
(2) Current	(ii) Barometer
(3) Pressure	(iii) Caloriemeter
(4) Density	(iv) Ammeter
	(v) Hydraulic press
	(vi) Voltmeter

2

Q. 2 (1) Write the vector equation which relates the vectors $\vec{LM}$ and $\vec{ML}$. 1

(2) State the difference between speed and velocity. 1

(3) State the principle of conservation of momentum. 1

(4) State Boyle's law. 1

(5) What do you mean by ' regelation ' ?

(6) What is meant by ' persistence of vision ' ? 1

(7) State ohm's law. 1

(8) State the principle of ' fuse-wire '. 1

Q. 3 (1) If M is [5, 0°] and N is [5, 180°], find the magnitude of vector $\vec{MN}$. 1

(2) A body is moving at the speed of 3 m/s in the same direction. What is its acceleration ? 1

(3) Find the weight of a body (in newton) if its mass is 10 kg. 1

(4) In Hare's apparatus, water column of height 16 cm is balanced by a kerosene column of height 20 cm. Find the density of kerosene. 1

(5) Find the heat required to convert 2 gm of ice at 0°C into 2gm of steam at 100°C. 1

(6) A convex lens has a focal length of 25 cm. Find its power. 1

(7) Find the total resistance when three resistances each of 30 ohms connected in parallel. 1

(8) Find the current passing through a filament of 60 W bulb, when P.D. is 230 Volts.

Q. 4 (a) (i) State Newton's Second Law of Motion. 1

(ii) Mention two types of forces that occur in nature. 1

(b) Giving two common examples, explain the concept of potential energy. 2

(c) (i) What is meant by 'anomalous behaviour of water' ?

(ii) Draw and lable the diagram of the apparatus used to demonstrate it. 1

(d) Show the diagram of the cross-section of the eye ball and label the different parts. 2

OR

Q. 4 (a) (i) Define the unit of work in M.K.S. system. 1

(ii) What is the work done by the gravitational force when a sphere is moved on a horizontal table ?

(b) What adjustments are necessary before we use a spectrometer ? 2

(c) Using the words 'current' and 'voltage' at proper places, fill in the blanks in the following statement and rewrite it. 2

"When resistances are connected in series, the division of ..... takes place at constant...., but when they are connected in parallel, division of ..... takes place at constant ..... ".

(d) How does a 'neon detector' work ? 2

Q. 5 (a) A stone of mass 1kg is thrown vertically upward with a velocity of 7 m/s. If gravitational acceleration is 9·8 m/s^2, —

(i) Find the K.E. of the body at the moment it is thrown up.

(ii) Find the potential energy of the body at the highest point. (Neglect air resistance)

(iii) What is the greatest height reached by the body ?

(iv) Which principle you make use of in this problem ?

(b) A solid of rectangular shape measures 25 cm × 8 cm × 5 cm, and its mass is 500 gm. Will it float on kerosene of density 0·8 gm/cm^3 ? Why ? 2

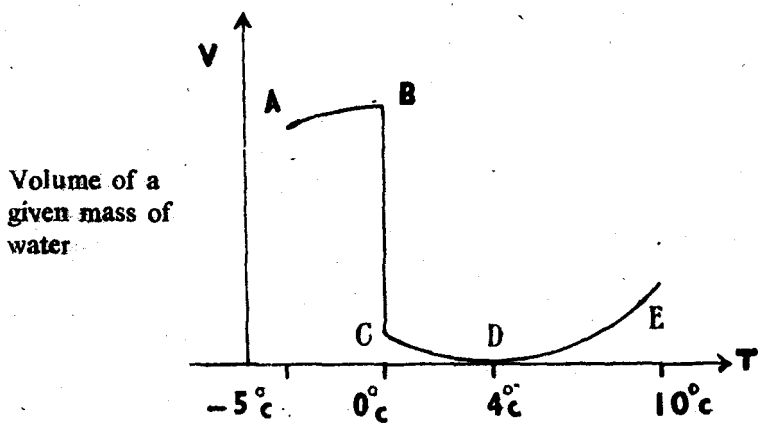
(c) (i) What is ' dispersion ' ?

(ii) What do you mean by a ' pure spectrum ? 1

(d) Describe an experiment to explain the magnetic effect of an electric current. 2

OR

). 5 (a) Observe the following graph and answer the questions below it.



(Fig. Paper 16·1)

(i) What does the part A B indicate ?

(ii) What does the part B C indicate ?

(iii) How does this graph describe the anomalous behaviour of water ?

(iv) Write down the temperature at which water (liquid state) has maximum density.

(b) What will happen in the following situations? Why ?

(i) Wire filament in an evacuated bulb is given negative potential relative to plate.

(ii) A current carrying solenoid is freely suspended.

(iii) A ' 5-amper fuse ' is replaced by a 15-ampere fuse. '

(iv) Electrical devices in our house are connected in series, instead of in parallel.

PAPER 17

Q. 1 (a) Complete the following statements by selecting an appropriate word or phrase from among the given alternatives and rewrite.

(1) The points P (4, 20°) and Q (4, 37°) are such that—

(a) they are distinct points at equal distances from the origin.

(b) they occupy the same position.

(c) the origin lies between these two points.

(d) the point P lies between the origin and point Q.

(2) The body situated at some point A is taken to a point B which is at a higher level. Therefore— 1

(a) potential energy will not change.

(b) potential energy will decrease.

(c) change in potential energy will depend upon the difference in heights of points A and B.

(d) change in potential energy will depend upon the actual path followed by the body from A to B.

(3) Acceleration is defined as— 1

(a) rate of change in velocity.

(b) rate of change in speed.

(c) rate of displacement.

(d) the small change in velocity in small time interval.

(4) A solid will float on liquid if— 1

(a) the buoyancy force acting on it is greater than its weight.

(b) the buoyancy force acting on it is equal to the weight of body.

(c) the buoyancy force acting on it is less than the weight of body.

(5) When a liquid is heated— 1

(a) the potential energy of the liquid molecules increases.

(b) the potential energy of the liquid molecules decreases.

(c) the kinetic energy of the liquid molecules decreases.

(d) the kinetic energy of the liquid molecules increases.

(6) 'Power of accommodation' of an eye is due to—

(a) retina (b) iris

(c) ciliary muscles (d) optic nerves. 1

(b) Match the pairs and rewrite them in your answer book.

(Function) A	(Part of eye) B
(1) Protecting the inner delicate parts of the eye,	(i) Choroid
(2) Protecting the eye from the stray light.	(ii) Eye-lens
(3) Changing the size of the pupil.	(iii) Cornea
(4) Forming real and inverted image of an object	(iv) Optic nerves
	(v) Iris
	(vi) Sclerotic.

Q. 2 (a) $\vec{a}$ and $\vec{b}$ are two vectors having equal magintudes and perpendicular to each other. If head of $\vec{a}$ coincides with tail of $\vec{b}$, show $(\vec{a} + \vec{b})$ and $(\vec{a} - \vec{b})$. 2

(b) A body is at rest. What is its acceleration ? Why ? 2

(c) Give a suitable example and explain what do you mean by 'inertia' of a body. 2

(d) (i) State the principle used in aneroid barometer. 1

(ii) State its advantages over Fortin's barometer. 1

Q. 3 (a) (i) What do you mean by 'an amorphous solid' ? 1

(ii) What can you say about the temperature during the melting process of an amorphous solid ? 1

(b) State the use of following :

(i) Circular scale of a spectrometer. 1

(ii) Levelling screws of prism table of spectrometer. 1

(c) (i) What is Edison effect ? 1

(ii) What are thermions ? 1

(d) (i) What do you mean by a 'phase wire' ? 1

(ii) State the use of energy meter near the main switch. 1

Q. 4 (a) According to Aristotle, 'A constant force is required for a steady motion.' Is this statement correct ? Why ? 2

(b) (i) What is meant by 'one atmosphere pressure' ? 1

(ii) At a certain depth in water, the absolute pressure is two atmospheres. Find guage pressure at that point. 1

(c) (i) What is meant by 'least distance of distinct vision ?

(ii) State what do you mean by 'power of a lens.' 1

(d) (i) Describe an experiment to explain the heating effect of an electric current. 2

OR

Q. 4 (a) (i) What is the ' kinetic energy ' of a body ? 1

(ii) What can you say about kinetic energies of two bodies having same mass and speed, but moving along two different directions ? 1

(b) Describe a simple experiment to demonstrate the effect cf room temperature on rate of evaporation.

(c) (i) Draw only a ray diagram to show the construction of a refracting type telescope. 1

(ii) Why does the objective of this telescope have a larger size ? 1

(d) (i) What are p-type semiconductors ? 1

(ii) State the use of semiconductors. 1

Q. 5 (a) Sphere A of mass m moving at 6m/s collides head on with another sphere B of double the mass moving in the same direction at 4 m/s. The velocity of sphere B, changes after collision to 5 m/s. 3

(i) Find the initial momentum of sphere A.

(ii) Find the initial momentum of sphere B.

(iii) Find the final momentum of sphere B.

(iv) Hence find the final momentum of sphere A.

(v) Find the velocity of sphere A after collision.

(vi) Which principle you have to use in this problem ?

(b) A body of mass 10 kg falls under gravity from a height of 20 metres. If it goes 2 metres deep in the mud and stops there — 2

(i) find the P.E. at the highest point.

(ii) find the K.E. when it touches the ground.

(iii) write down the work done by the stopping force exerted by the mud; and

(iv) find the average stopping force exerted by the mud.

(c) In my house, I use a 40 W bulb daily for 6 hours, a 60 W bulb daily for 6 hours and an electric water heater of 1000 W daily for 30 minutes.

(i) Find the consumption of electrical energy per day. 1

(ii) If meter reading on 1st September is 3937·4 KWH, find the reading on 1st October. 1

(iii) Find the cost of electrical energy at 30 paise per unit, including meter rent 50 paise per month. 1

OR

Q. 5 (a) Magnitude of $\vec{a}$ = 10 cm. Magnitude of $\vec{b}$ = 6 cm. Angle between $\vec{a}$ and $\vec{b}$ is 70°.

(i) With the help of diagram, show the resultant $\vec{r}$ of $\vec{a}$ and $\vec{b}$.

(ii) Measure and write the angle between $\vec{r}$ and $\vec{a}$. 1

(b) 4 gm of steam at 100°C is passed into 57 gm of water at 30°C. The resulting temperature is 70°C. 2

(i) Find the heat gained by the cold water.

(ii) Find the heat released by water formed from steam.

(iii) Hence find the heat released by steam while turning into water.

(iv) Hence find the latent heat of vaporization of water.

(c) The focal length of a convex lens is 12·5 cm. Find its power. State the unit of power. 1

(d) Three resistances of 120 Ω, 200 Ω and 300 Ω are connected in parallel, and this combination is connected to a 1·5 V drycell. 3

(i) Find the total resistance in the circuit.

(ii) Find the total current flowing through the circuit.

(iii) Find the current flowing through a resistance of 300 Ω.

CHEMISTRY

PAPER 1

Q. 1 (a) Give scientific reasons for : (Any Four) 2

(i) It is dangerous to handle yellow phosphorus.

(ii) Silica is used to prepare vessels to store very concentrated acids.

(iii) Sodium-chloride is used to preserve fish.

(iv) Sodium carbonate is used in laundries to wash dirty clothes.

(v) Magnesium is used in flash-light.

(vi) Zinc-oxide ointment is applied to wounds.

(b) Give explanations of any two of the following :— 2

(i) Half-life (ii) Mendeleeff's Rule

(iii) Controlled Chain-reaction

(c) Distinguish between any two of the following by giving two points of difference :— 2

(i) Ionisation and electrolytic dissociation.

(ii) α-ray's and β-ray's.

(iii) Atom and ion.

(d) Prepare following table in your answer book and write corrosponding observations in observation coloumn. 2

Gas	Indicator	Observation
(i) Sulphurdioxide	blue litmus	
(ii) Hydrogen Sulphide	lead acetate paper	
(iii) Chlorine	starch iodide paper	
(iv) Hydrogen chloride	red litmus	

Q. 2 (a) Name the process involved in the following reactions :— 2

(i) Mercury forms amalgam with sodium.

(ii) Calomel, when heated to 375°C gives out white fumes.

(iii) Milk changes to curd.

(iv) α-particles are thrown out by radium.

(v) Bazar salt becomes wet.

(vi) Sulphur dioxide is passed through cane-sugar solution.

(b) State what happens when following substances are heated (chemical Eqn. are not expected) :— 2

(i) Potassium permanganate

(ii) Magnesite

(iii) Red-lead

(iv) Sodium-bi-carbonate

(v) Red-Phosphorus

(vi) Mercury-Oxide

(c) Explain :— 2

(i) Concentrated acid (ii) Periodic law

(iii) Isomerism (iv) Volumetric calculations.

(d) Select appropriate words given below and fill in the blanks :— 2

(i) ..... is used as a catalyst in the conversion of yellow phosphorus to red-phosphorus.

(a) Iron oxide (b) Vanadium pentoxide

(c) Iodine (d) Bromine.

(ii) Silica is affected by ..... acid.

(a) HCL (b) H_2S

(c) HF (d) H_2SO_4.

(iii) Normality of 28gm/lit KOH solution is :—
(a) 1N (b) 5N
(c) 0·5N (d) 0·1N.

(iv) — gas is evolved when hot concentrated sulphuric acid is poured on sodium chloride.
(a) Hydrogen chloride (b) Sulphur dioxide
(c) Hydrogen sulphate (d) Sulphur-tri-oxide

Q. 3 (a) Write chemical equation and names of products in any two of the following reactions. 2
(i) Ammonia and Hydrogen chloride gas.
(ii) Antimony and chlorine.
(iii) Magnesium and dilute nitric acid.
(iv) Zinc and hot Solution of caustic-soda.

(b) Explain (any two) 2
(a) Acids in light of ionisation.
(b) Fermentation.
(c) Annealing.

(c) (i) Describe the process of preparation of ethyl-alcohol from molasses. $1\frac{1}{2}$
(ii) Which enzyme 'ferments' 'Nira'? $1\frac{1}{2}$

(d) Match the following 2

Group A	Group B
(i) Bangal Salt peter	(a) Potassium nitrate
(ii) Chili Salt peter	(b) Potassium sulphate
(iii) Dolomite	(c) Sodium nitrate
(iv) Carnallite	(d) Sodium carbonate
	(e) double carbonate of Mg and Ka
	(f) double chloride of Mg and K

1

Q. 4 (a) (i) Answer the following (any one)

(a) Method of preparation of SO_3

(b) Give three properties of $KClO_3$ $1\frac{1}{2}$

(ii) Name the constituents of match stick of Lucifer-matches. $\frac{1}{2}$

(b) (i) Explain how the separation of (1) dissolve salts and (2) undissolved salts is affected in purification of mercury.

(ii) Name the antipoisionous substances used in the poisioning of Murcuric-chloride.

(c) (i) ' Glass is a super cooled liquid of infinite viscocity ' Explain this statment by giving three reasons for the Justification of the same. $1\frac{1}{2}$

(ii) Name the reactants used for the preparation of Idoform.

(d) Gm. equivalent weight of sodium hydroxide is 40. Calculate the normality of 20gm/lit's sodium hydroxide. 1

OR

Calculate gm. equivalent weight of sulphuric acid. (atomic weight : H=1, O=16, S=16) 1

(ii) Write appropriate numbers in the place of ★ mark. 1

$$^{10}_{5}B + ^{4}_{2}He \rightarrow ^{\star}_{\star}N + ^{1}_{0}n$$

Q. 5 (a) Draw a neat and labled diagram of the following (any two) 3

(i) Electric furnace used to prepare phosphorus.

(ii) Structural formula of ' Dimethyl-ether. '

(iii) Preparation of hydrogen sulphide in laboratory.

(b) 25 ml. Solution of sodium hydroxide whose strength is 7·2gm/lit is required for complete neutralisaton of 20ml. nitric acid. Find the strength of acid-solution.

OR

(b) (i) Calculate the strength of sodium hydroxide solution. 50 ml. of 0·1N HCl is utilized for the neutralisation of 20 ml. sodium hydroxide. $1\frac{1}{2}$

(ii) Explain the action of caustic-soda on chlorine. (Write necessary chemical reaction). $1\frac{1}{2}$

(c) Fill in the blanks. 2

(i) —— was appointed as the first chairman of Atomic-Energy research laboratory.

(ii) Potassium salt imparts ..... colour to the flame.

(iii) In volumetric analysis of concentrated alkali and dilute acid ..... is used as an indicator.

(iv) Hardness of pyrex glass is due to ...

PAPER 2

Q. 1 (a) Give scientific reasons for : (any four) 2

(i) Conduction of electric current does not take place through the crystals of copper sulphate even if copper and sulphate are present in ionic form.

(ii) Glass article has to be cooled slowly.

(iii) The electrode of zinc used in voltaic cell is coated with zinc amalgam.

(iv) Zinc oxide is amphoteric-oxide.

(v) Walls of laboratory are not painted by ' white-lead '.

(vi) Yellow-phosphorus is not used in safety-matches.

(b) Explain the following : (any two) 2

(i) Caromel (ii) $E = mc^2$ (iii) Law of Triads.

(c) Distinguish between any two of the following by giving two points of difference. 2

(i) Crystalline and amorphous silicon.

(ii) Red – P and yellow – P.

(iii) Conduction of electricity through metals and solutions of electrolytes.

(d) Prepare the following table in your answer book and write corrosponding observations in observation coloumn. 2

	Indicator	Substance	observation
(i)	Starch iodide paper.	Bromine-gas	
(ii)	Red litmus paper	Sodium hydroxide	
(iii)	Lead acetate paper	Hydrogen sulphide	
(iv)	Turmeric paper	Copper hydroxide	

Q. 2 (a) Name the process involved in the following reactions. (any four) 2

(i) Conversion of cane-sugar into glucose and fructose with the help of invertase.

(ii) If crystals of sodium-carbonate are exposed to air water of crystallisation is thrown out.

(iii) Solid substance when heated vigorously changes in to gaseous state.

(iv) Bombardment of neutrons on the nucleus of uranium.

(v) Formation of crystals when saturated solution is boiled.

(vi) Zinc is separated when zinc-oxide is heated with coke.

(b) What happens when following substances are heated? (write chemical equations) 2

(i) Calcium-carbonate (ii) Sodium-nitrate

(iii) Soda-bi-carb (iv) Potassium-chlorate
(v) Corrosive sublimate (vi) Zinc-oxide. 2

(c) Explain :—

(i) Tollen's reagent (ii) Symbol $^{210}_{80}Po$

(iii) Dilute acid (iv) Magnalium.

(d) Fill in the blanks choosing appropriate word given below and rewrite the sentences.

(i) Carborundum is prepared from—

(a) carbon and silica (b) silica and magnesium
(c) silica and oxygen (d) silica and sodium

(ii) Change in ——— takes place, when radio-active isotope is formed.

(a) atomic-weight (b) atomic-number
(c) number of protons (d) number of electrons.

(iii) —— is soluble in potassium iodide.

(a) Chlorine (b) Bromine
(c) Iodine (d) Potassium.

(iv) —— is not the constituent of glass.

(a) Sodium silicate (b) Potassium silicate
(c) Calcium silicate (d) Calcium carbonate 2

Q. 3 (a) What happens when :— (write chemical reaction and names of the products) 2

(i) Potassium is dissolved in water.
(ii) Aluminium reacts with sodium hydroxide.
(iii) Hot red — P is held in gas jar of chlorine.
(iv) Copper foils are dipped in concentrated sulphuric acid.

(b) Explain : (any two) 2

(i) Irradiation. (ii) Radio active isotope.
(iii) Indicator.

(c) (i) Give method of preparation of glucose from starch. $1\frac{1}{2}$

(ii) Name the gas having greenish yellow colour. $\frac{1}{2}$

(d) In group 'A' different coloured glasses are given and in group 'B' the names of compounds which impart these colours are given. Match the following pairs. 2

Group 'A'	Group 'B'
(i) Ruby red glass	(a) Copper (I) oxide
(ii) Violet-coloured glass	(b) Chromium oxide
(iii) Yellow-coloured glassed	(c) Cobalt-oxide
(iv) Blue-coloured glass	(d) Antimony-sulphide
	(e) Manganese dioxide
	(f) Selenium oxide
	(g) Tin-oxide.

Q. 4 (a) (i) Answer any one of the following. $1\frac{1}{2}$

(a) What is the action of caustic-soda on chlorine ?

(b) How is soda-bi-carb prepared from washing soda ?

(ii) Which alloy of mercury is used for the preparation of mirrors ? $\frac{1}{2}$

(b) (i) Write different stages in the manufacture of bleaching powder. $1\frac{1}{2}$

(ii) Name the element which is used to affect separation of platinum from platinum compounds. $\frac{1}{2}$

(c) (i) Name the constituents of optical glass. $\frac{1}{2}$

(ii) How is 'Rinman's reagent' prepared ? $1\frac{1}{2}$

(d) (i) Calculate the strength in gm/lit of 1·5 N sulphuric acid.

(gm. equivalent weight of sulphuric acid is 49). 1

OR

(i) Calculate gm. equivalent weight of nitric-acid (H=1, N=14, O=16.) 1

(ii) Write appropriate numbers in place of * mark

$$^{210}_{82}Po \xrightarrow{-\beta} {}^{*}_{*}Bi$$ 1

Q. 5 (a) Draw neat and labelled diagram. (any two) 3

(i) Laboratory method of preparation of Chlorine gas from potassium permangenate.

(ii) Purification of mercury.

(iii) Ball and stick model of ethyl-alcohol.

(b) (i) 22 ml of potassium hydroxide soln. is required for complete neutralisation of 20 ml solution of 0·11N sulphuric acid. Calculate normality and strength of potassium hydroxide solution. $1\frac{1}{2}$

OR

(b) Calculate normality of hydrochloric acid, if 10 ml of HCI neutralises 15 ml. solution of sodium hydroxide whose strength is 4 gm/lit. $1\frac{1}{2}$

(ii) What is the action of concentrated nitric acid on lead ? $1\frac{1}{2}$

(c) Fill up the gaps 2

(i) Iodine crystals when heated .....

(ii) Chemically, glass is .....

(iii) ..... discovered element Pollonium.

(iv) The biggest thermal Power station in Maharashtra is at .....

PAPER 3

Q. 1 (a) Give reasons for any four of the following : 2

(i) Conduction of electric current takes place through melted sodium-chloride.

(ii) When ethyl-alcohol mixes with water, volume of mixture decreases.

(iii) For dilution of sulphuric acid, water is not added to concentrated sulphuric acid, but acid is added to water.

(iv) Chlorine cannot bleach printing ink.

(v) Silica is used to prepare vessels to store very concentrated acid.

(vi) If wind screens of motor car are cracked, no splinters are shot out.

(b) Explain : (Any two) 2

(i) Absolute alcohol. (ii) Newland's law of octaves.

(iii) Phosphorescence.

(c) Distinguish between any two of the following by giving two points of difference. 2

(i) Acid and Alkali

(ii) Bleaching action of Cl_2 and SO_2 .

(iii) Bromine and Chlorine

(d) Prepare the following table in your answer book and write molecular formula of gas evolved from the substance and acid given in acid coloumn. 2

Substance	Dilution of acid	Observation
(i) Zinc	Mod. con. HNO_3	
(ii) Magnesium	Very dil. HNO_3	
(iii) Lead	Con. HNO_3	
(iv) Red-lead	Con. HNO_3.	

Q. 2 (a) Name the process involved in the reactions (any four) 2

(i) Separation of ions that are held by electrostatic attraction.

(ii) Formation of salt and water by the action of acid and alkali.

(iii) Milk changes to curd.

(iv) Sugar charcoal is left behind if cane-sugar is heated.

(v) The water of crystallisation is thrown out if crystals of sodium carbonate are exposed to air.

(vi) If dilute hydrochloric acid is added to cane sugar and mixture is heated, glucose and fructose are formed.

(b) What is the action of heat on the following ? (Any four) 2

(i) Cane-sugar (ii) Bleaching powder
(iii) Potassium permanganate (iv) Sora
(v) Zine-sulphate (vi) Merchry (II) oxide

(c) Explain :— 2

(i) Halogen (ii) Dissociation
(iii) Rock-crystal (iv) Cullet

(d) Fill in the blanks choosing appropriate word given below and rewrite the statement. 2

(i) Chlorine helps ..... to burn.

(a) carbon compounds (b) inorganic compounds
(c) carbohydrates
(d) hydrocarbons

(ii) Sodium hydroxide is ..... substance.

(a) crystalline (b) hygroscopic
(c) deliquescent (d) efflorescent

(iii) β-particles ..... in electro static field

(a) are attracted towards positive pole
(b) are attracted towards negative pole
(c) are not affected

(iv) Cold-flame is due to—

(a) burning of phosphorus pentaoxide.

(b) burning of red-phosphorus.

(c) burning of yellow phosphorus.

(d) slow-burning of yellow phosphorus.

Q. 3 (a) Write chemical reactions and names of products in any two of the following :— 2

(i) Amorphous silicon is dissolved in hot and concentrated solution of sodium-hydroxide.

(ii) Copper piece is added to the solution of mercury (II) chloride.

(iii) Red-lead reacts with concentrated nitric-acid.

(iv) Steam is passed over heated zinc.

(b) Explain : (any two) 2

(i) Annealing.

(ii) The principle underlying the process of carbonation.

(iii) Neutralisation in the light of ionisation.

(c) (i) Give method of preparation of sulphur-tri-oxide from sulphur-di-oxide. $1\frac{1}{2}$

(ii) Name the constituents of tear gas. $\frac{1}{2}$

(d) In Group 'A' names of the scientists are given and in group 'B' their findings are given. Write proper finding before the name. 2

Group A :

(i) Newlands (ii) Lothar-Meyer

(iii) Mendeleeff (iv) Dobereiner

Group B :

(a) If three elements having similar properties are arranged in order of their at. wts. the at. wt. of middle element is nearly equal to mean of the atomic weights of other two.

(b) The properties of an element are similar to those of the 8th element counting it in the series from that element.

(c) Number of protons in an atom of any element is always constant.

(d) In the graph of atomic weight against atomic volume light metals are at the apex of the wave.

(e) In the graph of atomic weight against atomic volume inert gases are at the apex of the wave:

(f) If three elements having similar properties are arranged in order of their at.wts. the at.wt. of last element is nearly equal to the atomic weights of other two elements in the triad.

(g) Properties of elements are periodic functions of their atomic weights.

(h) Properties of elements are periodic functions of their atomic numbers.

Q. 4 (a) (i) Answer any one of the following :— $1\frac{1}{2}$

(a) Give laboratory method of prepation of epsum-salt from magnesium carbonate.

(b) Give three uses of radioactive isotopes.

(ii) Name the gas, which turns lead-acetate paper black. $\frac{1}{2}$

(b) (i) Describe electro thermal process of extraction of phosphorus. $1\frac{1}{2}$

(ii) Which simple test will you perform to detect the presence of sodium ? 1

(c) (i) How is idoform prepared in laboratory ? $1\frac{1}{2}$

(ii) Name the constituents of soda-limeglass. $1\frac{1}{2}$

(d) (i) Calculate the normality of 3·65% hydro chloric acid. 1

OR

(i) Calculate gram equivalent weight of sulphuric acid 1

(H = 1, O = 16, S = 32).

(ii) Write proper numbers in place of * mark 1

$$^{214}_{82}Pb \xrightarrow{-e} {}^{*}_{*}Bi$$

Q. 5 (a) Draw a neat and labelled diagram of any two of the following. 3

(a) Kipp's apparatus

(b) Ball and stick model of di-methyl-ether

(c) Hydrogen chloride gas fountain

(b) 56 gm of potassium hydroxide is dissolved in 500 ml. Calculate the normality of alkali. $1\frac{1}{2}$

(c) The equivalent volume of a solution of hydrochloric acid is 15 ml. The equivalent volume of a solution of sodium hydroxide is 22·5 ml. The normality of sodium hydroxide is 0·12N. Find normality and strength of hydrochloric acid solution. $1\frac{1}{2}$

(d) Fill in the blanks. 2

(i) ..... is used as a fuel in 'Pournima' reactor.

(ii) ..... discovered phosphorus.

(iii) Concentration of zinc ores is effected by ..... method.

(iv) ..... is given out through urine, if a person suffering from diabetes.

PAPER 4

Q. 1 (a) Give reasons for : (any four). 2

(i) Phosphorus does not occur in free state,

(ii) Silver-articles are not used in laboratory.

(iii) Bleaching powder becomes useless if exposed to air.

(iv) Ammonium hydroxide is weak alkali.

(v) Sodium is kept under kerosene.

(vi) Glass-articles are cooled slowly.

(b) Explain any two of the following. 2

(i) Normality (ii) Strength of a solution.

(iii) Indicators

(c) Distinguish between any two of the following by giving two points of difference. 2

(i) Chlorine and Bromine

(ii) Glucose and di-methyl ether.

(iii) Mercury and mercurous salts.

(d) Prepare following table in your answer book and write corrosponding observation in observation table 2

Indicator	Substance	Observation
(i) Strach iodide	Bromine	
(ii) Red-litmus	Sodium carbonate soln.	
(iii) Lead-acetate	Hydrogen sulphide soln.	
(iv) Turmeric	Potassium hydroxide soln.	

Q. 2 (a) Name the process underlying the following reactions. 2

(i) Bazar salt becomes wet when exposed to air.

(ii) The water of crystallisation is thrown out when crystals of sodium-carbonate are exposed to air.

(iii) Formation of glucose from starch.

(iv) Separation of ions by electricity.

(v) Formation of curd from milk.

(b) What happens when following substances are heated ? (any four): 2

(i) Sodium bi carbonate (ii) Cane sugar

(iii) Potassium permanganate (iv) Epsum salt

(v) Mercury-oxide (vi) Red-lead.

(c) Explain : 2

(i) Batch (ii) Arrhenius' Theory

(iii) Reversible chemical reaction (iv) Dilution.

(d) Fill in the blanks choosing appropriate word given below and rewrite the sentences 2

(i) Alcohol burns with a ..... flame.

(a) yellow (b) bluish

(c) Pale bluish (d) Violet.

(ii) Change occurs in ..... of an element, when it forms radioactive isotope.

(a) atomic weight (b) atomic number

(c) number of protons (d) number of electrons.

(iii) X-ray photograph of glass shows ..

(a) circles (b) concentric circles

(c) dots (d) semi-circles

(iv) Property of radioactivity was discovered by ..

(a) Rutherford (b) Henry Becquerel

(c) Marie curie (d) Dr. Homi Bhabha

Q. 3 (a) What happens when following are treated with each other. Write names of products obtained (any two) 2

(i) Solution of silver chloride and solution of silver nitrate

(ii) Magnesium wire is held in the gas jar of nitrogen.

(iii) Piece of paper moistened with turpentine is held in the gas jar of chlorine.

(iv) Steam is passed over red hot silicon.

(b) Explain : (any two) 2

(i) Fermentation-reaction (ii) Halogen

(iii) Atomic-energy

(c) (i) Give method of separation of zinc from zinc blende. $1\frac{1}{2}$

(ii) Name the compound used as red oil paint. $1\frac{1}{2}$

(d) In Group A certain properties are given and in group B compounds are given. Write proper compound or element before the given property. 2

Group A	Group B
(i) Amorphous white powder	(a) Epsum-salt
(ii) Bright white metal with bluish tinge	(b) Zinc-oxide
(iii) Silvery white substance	(c) Zinc-sulphate
(iv) Substance appears yellow when hot and white when cold	(d) Basic lead carbonate
	(e) Zinc sulphide
	(f) Zinc
	(g) Magnesium.

Q. 4 (a) (i) Answer any one of the following. $1\frac{1}{2}$

(a) Give three properties of corrosive-sublimate.

(b) How will you prepare sulpuric acid from sulphur-tri-oxide and concentrate it ?

(ii) Name the constituents of safty match-stick. $\frac{1}{2}$

(b) (i) Give various stages in the purification of sugarcane juice.

(ii) " Silver-bromide is used in preparing photographic plates." Why ? $\frac{1}{2}$

(c) (i) How will you prepare chlorine in laboratory ? $1\frac{1}{2}$

(ii) Name the substance obtained when sugar is heated at 200°C. $1\frac{1}{2}$

(d) (i) Gram equivalent weight of potassium hydroxide is 56 gm. Find the normality of solution whose strength is 2·45 gm/lit. 1

OR

(i) Find gram equivalent weight of caustic-soda 1
(K=39, O=16, H=1, Na=23).

(ii) Write proper number in place of * mark. 1

$$^{226}_{82}Ra \xrightarrow{-\propto} {}^{*}Rn \longrightarrow {}^{*}$$

Q. 5 (a) Draw neat and labelled diagram of any two of the following 3

(i) Circuit showing electric-dissociation

(ii) Controlled chain-reaction

(iii) Electric-furnace used in extraction of phosphorus

(b) (i) For the neutralisation of 25ml solution of 0·1 N sodium hydroxide 10 ml. of hydrochloric acid is required. Find the normality and strength of hydrochloric acid. $1\frac{1}{2}$

OR

(i) How many grams of sulphuric acid are required for the preparation of 0·15 N solution in 250 ml of water ? Equivalent weight of sulphuric acid is 49 gm.

(ii) What is the action of moist air on sodium ? $1\frac{1}{2}$

(c) Fill in the blanks 2

(i) Safety matches were first manufactured in .....

(ii) ..... is used in flash gun.

(iii) In modern periodic table there are spaces for ..... element.

(iv) ..... is the formula for potassium mangenate.

PAPER 5

Q. 1 (a) Give reasons for any four of the following : 2

(i) Phosphorus is considered as non-metal.

(ii) Chlorine is not collected over water.

(iii) Dry hydrogen chloride gas has no action on dry litmus.

(iv) Sugar charcoal is obtained when concentrated sulphuric acid is poured over sugar.

(v) There is no place for inert gases in Mendeleeffs periodic table.

(vi) Mercury (II) chloride is used to protect wooden sleepers.

(b) Explain any two of the following 2

(i) Silver mirror test

(ii) Rochelle salt (iii) Rectified spirit

(c) Distinguish between any two of the following by giving two points of difference. 2

(i) Newlands' scheme and Mendeleeffs scheme.

(ii) Strong acid and concentrated acid.

(iii) Yellow phosphours and red phosphorus.

(d) Prepere the following table in your answer book. and write the name of the gas produced by the action of acid on substance in observation column. 2

Substance	Acid observation
(i) Sodium bicarbonate	Hydrochloric.
(ii) Bleaching powder	Sulphuric
(iii) Mercury	con. sulphuric.
(iv) Zinc	dil. sulphuric.

Q. 2 (a) Name the process involved : (any four)

(i) Sugar charcoal is left behind when concentrated sulphuric acid is poured on cane-sugar.

(ii) α and β–rays are emitted from polonium nucleus.

(iii) Amalgam of tin is formed with mercury.

(iv) Violet coloured fumes are given out when iodine crystals are heated.

(v) Bazar-salt becomes wet when exposed to air.

(b) State the effect of heat in any four cases without chemical equation. 2

(i) Red-lead	(ii) Potassium nitrate
(iii) Sodium bi carbonate	(iv) Mercuric-oxide
(v) Bleaching powder	(vi) Zinc-oxide.

(c) Explain :

(a) Weak alkali	(b) Notation $^{30}_{15}P$	2
(c) Denatured spirit	(d) Defecation	

(d) Fill in the blanks choosing appropriate words given below and rewrite the sentence. 2

(1) In modern periodic table —— of element has been taken as a basis of classification—

(a) atomic volume	(b) atomic number
(c) atomic weight	(d) equivalent weight

(2) When an electric-current flows through a solution :—

(a) transfer of electrons takes place.

(b) no chemical change takes place.

(c) transfer of ions takes place.

(d) temperature of solution increases.

(3) Hardness of pyrex-glass is due to—

(a) boric oxide (b) sodium oxide

(c) aluminium oxide (d) selenium oxide

(4) In the case of serpent bite, an incision is taken at the wound and —— powder is pressed in to it.

(a) potassium chlorate

(b) potassium chloride

(c) potassium permanganate

(d) potassium manganate

Q. 3 (a) Write chemical equations of following, stating names of products formed : (Any two)

(i) Sodium-nitrate and sulphuric acid.

(ii) Hydrogen sulphide gas is passed through the solution of lead nitrate.

(iii) Red phosphorus and iodine crystals.

(iv) Sodium hydroxide and copper sulphate solution.

(b) Explain : (Any two)

(i) Safety-match (ii) cold-flame

(iii) chlorine-water

(c) (i) Give method of preparation of ethyl-alcohol from ethylene gas.

(ii) Name the element which is in liquid state at atmospheric temperature.

(d) In group ' A ' information about volumetric calculation is given and in group ' B ' indicators required are given. Write proper indicator before the item in group A. 2

Group A	Group B
(i) Strong acid and strong alkali	(a) litmus paper
(ii) Strong acid and weak alkali	(b) phenolphthalein
(iii) Weak acid and strong alkali	(c) methylorange
(iv) Weak acid and weak alkali	(d) turmeric paper
	(e) fehling's solution
	(f) lead acetate paper
	(g) none is satisfactory

Q. 4 (a)) i) Answer any one of the following :— $1\frac{1}{2}$

(a) How will you prepare red-phosphorus from yellow phosphorus ?

(b) Give any three chemical properties of caustic-soda. $1\frac{1}{2}$

(ii) Name the constituents of lead-glass. $\frac{1}{2}$

(b) (i) How is purification of nitric acid brought about ? $1\frac{1}{2}$

(ii) Name the constituents of alloy ' Magnalium '. $\frac{1}{2}$

(c) (i) How is carborandum prepared ? $1\frac{1}{2}$

(ii) Name the enzyme which brings about the conversion of glucose into ethyl-alcohol. $\frac{1}{2}$

(d) (i) Find the normality of hydrochloric acid whose strength is 3·65 gm/lit. 1

OR

(i) Calculate gram equivalent weight of hydrochloric acid. (H = 1, Cl = 35·5).

(ii) Write proper numbers in place of * mark. 1

$$\overset{10}{\underset{6}{B}} + \overset{4}{\underset{2}{He}} \rightarrow \overset{*}{\underset{*}{N}} + \overset{1}{\underset{0}{n}}$$

Q. 5 (a) Draw neat and labelled diagram for any two of the following :— 3

(a) Preparation of hydrogen chloride gas in laboratory.

(b) Purification of mercury. (c) Contact-chamber.

(b) 15 ml. of hydrochloric acid is required for complete neutralisation of 25 ml of sodium hydroxide whose strength is 4 gm/lit. Find the normality of hydrochloric acid. $1\frac{1}{2}$

OR

(b) (i) 20 ml of 0·1 N sodium hydroxide is required for the neutralisation of 15·5 ml. of sulphuric acid. Find normality and gm/lit of sulphuric acid. $1\frac{1}{2}$

(ii) What is the action of potassium hydroxide on amorphous and crystalline silicon ? $1\frac{1}{2}$

(c) Fill in the blanks :—

(i) On the south-western shores of India compounds of —— are found.

(ii) 1 amu (atomic mass unit) = —— grams.

(iii) —— is used in smoke-screen.

(iv) —— discovered radium. 2

———

PAPER 6

Q. 1 (a) Give scientific reasons for : (any four) 2

(i) Glucose is given to patients.

(ii) Drycoloured flowers are not bleached by chlorine.

(iii) Sodium is kept under kerosene.

(iv) Sodium nitrate is not used in preparing gun powder.

(v) Reducing agent is not required when mercury is extracted from cinnabar.

(vi) Potassium chlorate is added to the mixture which is used for the preparation of glass.

(b) Explain any two of the following : 2

(i) Phospher-bronze. (ii) Degree of dissociation.

(iii) Tollen's-reagent.

(c) Distinguish between any two of the following by giving two points of difference. 2

(i) Ionisation and dissociation

(ii) Action of chlorine and solubility of yellow P and red P.

(iii) Ethyl-alcohol and di-methyl ether.

(d) Prepare the following table in your answer book and write the name of gas produced by the action of acid on corresponding substance. 2

Substance	Acid	Observation
(i) Sodium-sulphite	Sulphuric	
(ii) Iron-Pyrites	Hydrochloric	
(iii) Potassium permanganate	Hydrochloric	
(iv) Zinc	Hot and con. nitric	

Q. 2 (a) Name the process involved in the following reactions— (any four) 2

(i) Bombardment of neutrons on uranium-nucleus.

(ii) Conversion of cane-sugar into glucose by invertase.

(iii) Formation of curd from milk.

(iv) β-rays are emitted from cobalt.

(v) Any crystal when exposed to air, its water of crystallisation is lost.

(b) State the action of heat on any four of the following :

(i) Sodium nitrate (ii) Zinc oxide

(iii) Red-lead (iv) Potassium chlorate

(v) Mercury oxide (vi) Epsumsalt

(c) Explain :

(i) Barly sugar (ii) Caromel,

(iii) Notation ^{60}Co (iv) Carborandum.

(d) Fill in the blanks choosing appropriate words given below and rewrite the sentence. 2

(i) Sodium borate is .....

(a) acidic (b) alkaline

(c) neutral (d) amphoteric

(ii) Atomic number of an element ..... if α-particle is lost.

(a) decreases by one (b) decreases by four.

(c) decreases by two (d) increases by one.

(iii) Chlorophyll of the plant has ..... salts.

(a) sodium (b) potassium

(c) calcium (d) magnesium

(iv) Phosphorus was discovered by .....

(a) Brant (b) Scheele

(c) Lavoisier (d) Marie curie

Q. 3 (a) Write the chemical equations of the following interactions stating names of the products formed — 2 (any two)

(i) Zn and caustic soda

(ii) Magnesium and nitric acid (concentrated more than 1%)

(iii) Silicon di-oxide and hydrofluoric acid

(iv) Bleaching powder and dilute sulphuric acid

(b) Explain : (any two) 2

(i) Function of ammonia in Solvay's process.

(ii) Sulphitation. (iii) Basic lead carbonate.

(c) (i) Give three important properties of glass, $1\frac{1}{2}$

(ii) Name the element which is in the liquid state. 1

(d) Group A gives compounds and Group B gives uses Match the pairs.

Group 'A'	Group 'B'
(i) Sodium carbonate	(a) Preparation of effer-
(ii) Sodium nitrate	vescent drinks
(iii) Sodium hydroxide	(b) Separation of soap
(iv) Sodium bi-carbonate	from soap mixture
	(c) used in mercerizing cotton
	(d) to prepare artificial fertilizers
	(e) to prepare soft glass
	(f) used as a medicine
	(g) to prepare gun powder

Q. 4 (a) (i) Answer any one of the following. $1\frac{1}{2}$

(a) Give method of extraction of lead from galena.

(b) Give any three properties of potassium nitrate.

(ii) Name the constituents of 'Aqua-regia.' $\frac{1}{2}$

(b) (i) Give method of preparation of ethylalcohol from mollases. $1\frac{1}{2}$

(ii) Why phosphorus bombs are used on battle field ? $\frac{1}{2}$

(c) (i) Give method of preparation of ' Calomel ' $1\frac{1}{2}$

(ii) Name the constituents of ' water glass ' $\frac{1}{2}$

(d) (i) Equivalent weight of potassium hydroxide is 56 gm. Find the normality of 5·6 gm/lit KOH solution. 1

OR

(i) Find gm equivalent weight of potassium dicromate.
(K=39, O=16, Cr=52) 1

(ii) Write proper numbers in place of * mark 1

$$^{210}_{83}Bi \xrightarrow{-\beta} {}^{*}_{*}Po$$

Q. 5 (a) Draw a neat and labelled diagram of any two of the following— 3

(i) Ball and stick model of dimethylether

(ii) Preparation of hydrogen sulphide from iron pyrates

(iii) Hansenclever's plant

(b) (i) For complete neutralisation of 20 ml of 0·15N H_2SO_4, 25 ml. of alkali solution is required. Find the normality of alkali. If alkali is NaOH, find its strength. $1\frac{1}{2}$

OR

(i) 50 ml solution of NaOH is boiled and 0·2 gm NaOH past is obtained. Find the normality of NaOH solution used.

(ii) What is the action of— $1\frac{1}{2}$

(i) H_2O (ii) dil. HCl (iii) Con. H_2SO_4 on mercury.

(c) Fill in the blanks— 2

(i) Rochell's salt means .....

(ii) Control rods in atomic reactors are of .....

(iii) There are hot springs at ..... and ..... in Maharashtra.

PAPER 7

Q. 1 (a) Fill in the blanks choosing appropriate words given below and rewrite the sentences— 2

(i) Enzyme ..... hydrolyses ' Nira ' into ethyl alcohol.

(a) Invertase (b) Zymase

(c) Mysase (d) Rennin.

(ii) In 250ml. of water 10gms of sodium hydroxide is dissolved. Its normaily is ..

(a) 1N (b) 0·5 N (c) 0·25 N (d) 0·1N

(iii) Very pure quartz is called ...

(a) cristobalite. (b) cat's eye.

(c) tridymite. (d) rock-crystal.

(iv) Acidiated solution of potassium permanganate becomes colourless when hydrogen sulphide is passed, becuse ...

(a) gas oxidises potassium permanganate.

(b) gas is a bleaching agent.

(c) gas reduces potassium permanganate.

(b) Write the molecular formula of gas produced in following cases. Also write chemical equation. 1

(i) $Zn + \text{hot. con. } HNO_3 \rightarrow$

(ii) $Ca(OH)_2 + NH_4Cl \rightarrow$

(c) Write the name of catalyst used to affect following conversions— 1

(i) $SO_2 \rightarrow SO_3$ (ii) Glucose $\rightarrow$ Ethyl alcohol

(d) Match the following pairs— 2

Group A	Group B
(i) Tear-gas	(a) Bromine
(ii) Water plant	(b) Chloride

(iii) Ointment for skin
(iv) Extraction of platinum

(c) Iodide
(d) Carbon compounds of bromine
(e) Chlorine
(f) Iodine

(e) Complete the following— $\frac{1}{2}$

$(AgNO_3 + H_2O) : (Ag^+ + NO_3^-) : : (NaCl + H_2O) : (?)$

(f) Name the element which when exposed to air, glows in the dark. $\frac{1}{2}$

(g) Classify into acid and base 1

(i) phenolphthalein becomes pink.

(ii) turmeric paper remains yellow.

Q. 2 (a) Select the features of modern periodic table from the following and write them in answerbook. 1

(i) arrangement according to increasing order of atomic weights of elements.

(ii) arrangement according to increasing order of atomic-number of elements.

(iii) 7 periods and 8 groups.

(iv) groups of three elements having similar properties.

(b) Name the substances obtained by the hydrolysis of cane-sugar 1

(c) Distinguish between each of the following substances according to the property mentioned against them. 1

(i) Sulphur, Iodine, phosphorus, Silicon— (allotropy)

(ii) KNO_3 NaCl, $MgCl_2$, $MgSO_4$— (water of crystallisation)

(d) Write proper numbers in place of * mark. 1

$$\overset{27}{\underset{13}{Al}} + \overset{4}{\underset{2}{He}} \rightarrow \overset{*}{\underset{*}{P}} + \overset{1}{\underset{0}{n}}$$

(e) Name the substances according to their properties given below :—

(i) Insoluble in water but used as a purgative.

(ii) Substance when dropped in water brilliant sparks of violet colour are thrown out.

(f) Eqivalent weight of sodium hydroxide is 40 gm. Find the normality of alkali, when 4 gms of alkali is dissolved in one litre of water. 2

Q. 3 (a) Name the substance left behind, after heating of the following— 1

(i) Potassium-nitrate (ii) Baking-Powder.

(b) What is the action of water on — 1

(i) Potassium (ii) Zinc.

(c) Write the chemical equation which indicates effect of heat on potassium chlorate. 1

(d) What should be done :

(i) Sodium should not get affected by air. 1

(ii) A sheet, which is not affected by both acids and alkali, is to be prepared. 1

(iii) Wooden sheets are to be protected from white ants. 1

(iv) Onions and potatoes are to be stored for being used as seeds. 1

(e) " In contact-chamber process, V_2O_5 catalyst is more useful than platinised asbestos." Explain this statement giving reasons. 1

Q. 4 (a) Distinguish between : 4

(i) Action of caustic soda on yellow P and red P

(ii) Lucifer matches and safety matches

(iii) Transfer of anion and cations after dissociation

(iv) Use of Zinc-oxide and white lead as white paint.

(b) Give the structural formulae of : 2

(i) ethyl alcohol (ii) glucose

(c) Find out the equivalent volume of 0·5N NaOH required for the neutralisation of 20ml. of 0·1N HCl. 2

OR

Find out the strength of 0·25 N caustic-potash soln. whose normality is 0·25 N.

(K=39, O = 16, H = 1)

Q. 5 (a) Give scientific reasons for : 4

(i) In Atomic-reactors Boron rods are used

(ii) Close contact with vapours of yellow phosphorus is avoided

(iii) Silver becomes black in presence of hydrogen sulphide

(iv) Electric current flows through molten sodium chloride.

(b) Answer any one of the following : 4

(i) On what factors degree of dissociation depends?

(ii) Give method of preparation of glucose from starch.

(iii) How is carborandum prepared ? Give its one property and one use.

(iv) Name the two allotropes of sulphur and give two points of difference between them.

(v) Write a short note on : " Bleaching action of chlorine."

———

PAPER 8

Q. 1 (a) Fill in the blanks choosing appropriate words from given below and rewrite the sentence. 2

(i) Equivalent weight of alkali = ...

(a) molecular weight of alkali

(b) molecular weight ÷ total number of atoms.

(c) molecular weight ÷ number of hydrogen atoms.

(d) atomic weight of alkali × valency.

(ii) ..... is used as a diamond.

(a) Agate (b) Opal

(c) Cat's eye (d) Flint

(iii) In Lothar Meyer's graph ..... are located at the apex of the wave.

(a) gaseous elements (b) metals

(c) metals having high melting points

(d) light metals

(iv) α- particles ..... in electro magnetic field.

(a) turn towards negative pole

(b) turn towards positive pole

(c) passe straight (d) turn behind,

(b) Write the molecular formula of a gas produced in following cases and also write their chemical equations. 1

(i) Pb_3O_4 + con. H_2SO_4 →

(ii) MnO_2 + con. HCl →

(c) Name the catalyst used in following reactions. 1

(i) Yellow P → Red-P (ii) SO_2 → SO_3.

(d) Match the following. 2

Group A	Group B
(i) Phosphorus	(a) water plant
(ii) Magnesium	(b) cinnabar
(iii) Chlorine	(c) bones
(iv) Iodine	(d) salt
	(e) galena
	(f) carnallite.

(e) Complete the following : $\frac{1}{2}$

(FeS + HCl) : (H_2S) : : (FeS + H_2SO_4) : (?)

(f) Name the 'by-products' obtained in Solvay's Process, . $\frac{1}{2}$

(g) Classify into acid and base : 1

(i) Methyl orange becomes red

(ii) Phenolphthalein becomes pink

Q. 2 (a) Select the features of radioactive isotopes from the following and write them in answer book. 1

(i) bombardment of α, β particles or neutrons on the nucleus of an element.

(ii) use of boron rods.

(iii) change in atomic number of an element.

(iv) used as indicators or tracers.

(b) Name the products obtained by the bombardment of α-particles on the nucleus of boron ($^{10}_{5}B$). 1

(c) Distinguish between substances according to the property mentioned against them and write the name of substance which does not resemble the others— 1

(1) Diamond, carborandum, boron-carbide, graphite —— (Hardness)

(2) Uranium, pollonium, helium, radium —— (Radioactivity).

(d) Write the proper numbers in place of * mark. 1

(e) Name the substace having following property. 1

(i) Violet–coloured sublimating element.

(ii) Substance becomes yellow when hot and becomes white when cold.

(f) Equivalent weight of sulphuric acid is 49 gm. In 500 ml of sulpuric acid 4·9 gm of acid is present. Find the normality of sulphuric acid.

Q. 3 (a) Name the products left behind when following substances are heated. 1

(i) Epsum salt (ii) Mercuric-oxide

(b) What is the action of water on : 1

(i) Carbon monoxide. (ii) Magnesium

(c) Write with the help of chemical equation the effect of heat on red-lead. 1

(d) What should be done : (each carry 1 mark)

(i) ' Nira ' is to be preserved without decomposition.

(ii) To identify the presence of starch in butter.

(iii) To detect whether the given substance is lead or not.

(iv) Walls of laboratory are to be painted with white paint which should not become black.

(e) " Generally the elements from 8th group are inert-gases " Explain this statement.

Q. 4 (a) Distinguish between : 4

(i) Action of chlorine and bromine on starch iodide paper.

(ii) Action of alkali on crystalline and amorphous silicon.

(iii) Action of water on sodium and potassium

(iv) Conduction of electric current through crystals of sodium chloride and molten sodium chloride.

(b) Give structural formulae of : 2

(i) glucose (ii) acetylene.

(c) Find the strength of 0·15 N hydrochloric acid.

OR

(c) Find gram equivalent of nitric acid. 2

(H = 1, O = 16, N = 14, Cl = 35·5)

Q. 5 (a) Give scientific reasons for : 4

(i) Yellow phosphorus is not used in safety-matches.

(ii) Bleaching powder becomes useless if exposed to air.

(iii) There is no repulsion between protons in the nucleus.

(iv) Potassium-chlorate is added to the mixture used for the preparation of glass.

(b) Answer any one of the following. 4

(i) What is the chemical composition of glass ? How are coloured glasses prepared ?

(ii) How is glucose prepared from starch ?

(iii) How is mercury purified ? Explain with the help of diagram.

(iv) Give manufacturing process of sulphuric acid.

(v) Write a note on safety match on the following points.

(a) substances used (b) process of ignition

PAPER 9

Q. 1 (a) Fill in the blanks with appropriate words given below and rewrite the sentence. 2

(i) A factory for the manufacture of the fuel required for atomic reactor has been commissioned in —

(a) Tarapur (b) Hyderabad

(c) Madras (d) Kottayam.

(ii) If 20 gm of hydrochloric acid is dissolved in one litre, then that solution is called—solution

(a) 40 gm/lit (b) 20 gm/lit

(c) 0·20 gm/lit (d) 0·020 gm/lit

(iii) —Volumes of hydrogen chloride gas dissolve in one volume of water at room temperature.

(a) 452 (b) 254 (c) 524 (d) 542

(iv) If 20 ml. of alcohol is mixed in the same volume of water, then volume of mixture becomes—

(a) 20 ml. (b) 40 ml. (c) more than 40 ml.

(d) more than 20 ml. and less than 40ml.

(b) Write the molecular formula of the gas produced in the following cases and also write chemical equations. 1

(i) $NaCl + H_2SO_4 \rightarrow$ (ii) $NH_4Cl + NaOH \rightarrow$

(c) Write the name of catalyst which brings about the following conversions. 1

(i) Glucose → Ethyl-alcohol.

(ii) Potassium chlorate → oxygen.

(d) Match the following : 2

Group A	Group B
(i) Deliquescent substance	(a) Potassium nitrate
(ii) Hygroscopic substance	(b) Sodium nitrate
(iii) Phosphorescent substance	(c) Caustic soda
(iv) Efflorescent substance	(d) Sodium carbonate
	(e) Red-phosphorus
	(f) Yellow-phosphorus
	(g) Carborandum

(e) Complete the following : $\frac{1}{2}$

$(NaCl + H_2O) : (Na^+ + OH^-) :: (BaCl_2 + H_2O) : (?)$

(f) Which gas is reducing agent–SO_2 or H_2S ? $\frac{1}{2}$

(g) Classify as acid and base : 1

(i) Phenolphthalein becomes colourless

(ii) Turmeric paper becomes reddish brown.

Q. 2 (a) Select the features of contact-process of manufacture of sulphuric acid from the following — 1

(i) Chlorine gas is passed into dry slaked lime.

(ii) Iron pyrites is burnt in air.

(iii) V_2O_5 is used as a catalyst.

(iv) Mixture of air is passed through water.

(v) Sulphur-di-oxide is passed into water.

b) Which is the element obtained at anode after ionization of copper-sulphate ? 1

c) Distinguish between each of the following substances according to property mentioned against them and write the name of substance which does not resemble in that group. 1

(i) Silver iodide, Silver sulphide, Antimony sulphide, Phosphorus sulphide — (Inflamable substance)

(ii) SO_3; P_2O_5; CO_2, Na_2O — – (acidic-oxide).

(d) Write proper numbers in place of * mark 1

$$^{27}_{13}Al + ^{4}_{2}He \rightarrow ^{*}_{*}P + ^{1}_{0}n$$

(e) Name the substance having following property — 1

(i) Metal which is in liquid state at room temperature

(ii) Insoluble in water but soluble in potassium iodide solution

(f) Find the normality of 9·45 gm/lit solution of nitric acid. (H = 1, N = 14, O = 16) 2

Q. 3 (a) Name the product left behind after heating of the following : 1

(i) Calcium-carbonate (ii) Sodium-bi-carbonate

(b) What is the action of water on : 1

(i) Sodium (ii) Mercury (I) Chloride

(c) Write with the help of chemical equation, the effect of heat on sora. 1

(d) What should be done :

(i) it is required to detect ethyl alcohol and dimethyl ether. 1

(ii) if acidity of stomach is increased. 1

(iii) to prevent milk from becoming sour in summer. 1

(iv) to identify hydrogen-sulphide from different gas jars. 1

(e) ' There is no definite molecular formula for glass. ' Explain this statement. 1

Q. 4 (a) Distinguish between each of the following : 4

(i) Action of chlorine and bromine with hydrogen

(ii) Action of air on red-phosphorus and yellow–p

(iii) Uses of calomel and corrosive sublimate

(iv) change taking place in the nucleus of an element if α and β- particles are lost.

(b) Give structural formulae of 2

(i) Ethyl-alcohol (ii) Di-methyl-ether.

(c) For complete neutralisation of 15 ml. of 0·5N HCl 7ml. of NaOH is required. Find the normality of NaOH.

OR

(c) Find the strength of 0·25N potassium hydroxide solution. (K = 39, O = 16, H = 1)

Q. 5 (a) Give scientific reasons for : 4

(i) Animal-charcoal is not used in the preparation of glucose.

(ii) Perydene is mixed in ethyl-alcohol in small quantities.

(iii) Crucibles of silica even if heated to red hot and then at once plunged into cold water, do not crack.

(iv) Yellow phosphorus is kept under water.

(b) Answer any one of the following : 4

(i) Give method of preparation of bleaching powder.

(ii) 'Glass is a super cooled liquid'. Justify this statement by giving three reasons.

(iii) What do you mean by Fermentation ? Give one example of Fermentation reaction.

(iv) How is lead extracted from galena ?

(v) Give two chemical properties and two uses of phosphorus.

PAPER 10

Q. 1 (a) Fill in the blanks with appropriate words given below and rewrite the sentences. 2

(i) —— proved that phosphorus is an element

(a) Brant (b) Lavoisier

(c) Scheele (d) Davy

(ii) Glass becomes ——— when heated

(a) solid (b) hard

(c) viscous (d) transparent

(iii) In the titration of strong alkali and dilute acid ——— is used as an indicator.

(a) litmus (b) phenolphthalein

(c) methylorange (d) turmeric paper.

(iv) ——— is a zinc ore.

(a) Cerussite (b) Calamine

(c) Dolomite (d) Carnallite.

(b) Write the molecular formula of a gas produced in the following reactions and write chemical equations. 4

(i) Hg + con HNO_3 →

(ii) Pb_3O_4 + Con HCl →

(c) Write the name of catalyst used in following reactions. 4

(i) Yellow P → Red P

(ii) Cane Sugar → Glucose

(d) Match the following 2

Group A	Group B
(i) Sodium chloride	(a) preparation of soft glass
(ii) Sodium nitrate	(b) preparation of matches
(iii) Potassium chlorate	(c) preparation of hard glass

(iv) Potassium-nitrate

(d) preparation of sodium carbonate

(e) preparation of nitric acid.

(e) Complete the following : $\frac{1}{2}$

(Hydrogen sulphide): (kipp's aparatus) : :

(Bleaching powder) : (?)

(f) Name the heaviest metal.

(g) Classity in to acid and base

(i) Red litmus turns blue.

(ii) Methyl orange becomes red.

Q. 2 (a) Select the features of Fehling's reagent from the following : 1

(i) Sodium hydroxide + potassium hydroxide

(ii) Sodium hydroxide + Rochelle's salt + copper sulphate

(iit) Sodium hydroxide + Epsum salt + copper sulphate

(iv) The colour of glucose solution becomes yellowish or red

(v) Test tube looks bright as mirror if poured on glucose.

(b) Name the substances obtained by the action of air on lead.

(c) Distinguish between each of the following according to the property mentioned against them and write the name of substance which does not resemble to that group : 1

(i) $KMnO_4$; Pb_3O_4; $KClO_3$; $CaCO_3$ (oxidising agent)

(ii) I, S, NH_4Cl, Hg_2Cl_2 --(sublimating substance)

(d) Write proper numbers in place of * mark. 1

$$^{214}_{83}Bi \xrightarrow{-\beta} {}^{*}_{*}Po$$

(e) Name the substance according to the given property 1

(i) Starch-iodide paper turns yellow.

(ii) Substance is used as a medicine against lucomia.

(f) The molecular formula of acetic acid is CH_3COOH. How many grams of acetic acid are required to prepare 0·1N solution in one litre of water. 2

(H = 1, C = 12, O = 16)

Q. 3 (a) Name the product left behind after heating of the following : 1

(i) Bleaching powder

(ii) Potassium permanganate

(b) What is the action of water on— 1

(i) Silicon di oxide (ii) Potassium

(c) Indicate with chemical equation the effect of heat on sodium nitrate 1

(d) What should be done : 4

(i) To prepare " Rub-any where " matches

(ii) To detect the presence of diabetes

(iii) To prepare non-rusting vessel from iron

(iv) To prepare mirrors

(e) " Mendeleeff had left empty spaces in his periodic table ". Explain this statement. 1

Q. 4 (a) Distinguish between each of the following : 4

(i) Penetrating power of α and β particles

(ii) Sp. gravity of yellow P and red P

(iii) States of bromine and chlorine

(iv) Action of water on crystalline and amorphous silicon

(b) Give structural formulae of :

(i) Ethyl-hydrogen sulphate (ii) Methane

(c) How much 0·1N KOH is required for the neutralisation of 15ml solution of 0·15N HCl ? 2

OR

(c) Equivalent weight of sulphuric acid is 49 gm. Find the strength of 0·25N sulphuric acid

Q. 5 (a) Give scientific reasons for : 4

(1) In the method of manufacturing of sulphuric acid, a mixture of gases is passed through Fe (III) hydroxide solution.

(2) Cloth bleached with bleaching powder is soaked with sodium bi-sulphite

(3) In preparing ethyl-alcohol from cane sugar, small quantity of sulphuric acid is added to molasses

(4) In the extraction of phosphorus from bone-ash, sand is added to the mixture

(b) Answer any one of the following : 4

(i) How is zinc extracted from zinc blende ?

(ii) State the properties of glass.
How is ' Pyrex ' glass prepared ?

(iii) How is cane sugar purified ?

(iv) Name the allotropes of phosphorus and give two points of difference between them

(v) How is washing-soda manufactured ?

PAPER 11

Q. 1 (a) Fill in the blanks with appropriate words given below and rewrite the sentences. 2

(i) — does not form amalgum with mercury

(a) Copper (b) Sodium (c) Iron (d) Gold.

(ii) In atomic reactors —— is used to slow down the neutrons.

(a) heavy water (b) acidified water
(c) soft water (d) hard water

(iii) Very pure quartz is known as —

(a) Irish diamond (b) sand stone
(c) amethyst (d) sand

(iv) —— introduc theory of ionisation.

(a) Gobler (b) Arrhenius
(c) Boyle (d) Scheele.

(b) Write the molecular formula of gas produced in the following reactions and write chemical equations 1

(i) $Pb + NaOH \rightarrow$ (ii) $Hg + con.\ H_2SO_4 \rightarrow$

(c) Write the name of the catalyst used in the following reactions. 1

(i) $SO_2 \rightarrow SO_3$ (ii) Glouse → Ethyl-alcohol.

(d) Match the following pairs. 2

Group A	Group B
(i) Red phosphorus	(a) amimal bones
(ii) Yellow phosphorus	(b) Lucomia
(iii) Radioactive phosphorus	(c) Soluble at room temp.
	(d) kept under water
(iv) Calcuim phosphate	(e) Insoluble in CS_2
	(f) molecule composed of 6-atoms.

(e) complete the following.

$(CUSO_4 + H_2O) : (CU^{++} + SO_4^{--}) :: (Ag\ NO_3 + H_2O) : (?)$

(f) Name the substance which turns black in contact with ammonia and is a sublimating one. $\frac{1}{2}$

(g) Classify into acid and base. 1

(i) Methyl orange becomes red.

(ii) Turmeric paper turns reddish brown.

Q. 2 (a) Select the features of method of preparation of glass from the following : 1

(i) Mixture of sand and lime.

(ii) Mixture of sand, lime and soda ash.

(iii) Manganese sulphide is added to the mixture.

(iv) Manganese dioxide is added to the mixture.

(v) Mixture of sand, tin oxide, selenium oxide.

(b) Name the metal from which ' magic-wire ' is prepared. 1

(c) Distinguish between each of the following substances according to property mentioned against them and write the name of substance which is not resembling to them. $\frac{1}{2}$

(i) carbon, hydrogen, hydrogen sulphide, carbondioxide — (Reducing agent)

(ii) NaOH, NaCl, H_2SO_4, C_6H_6 (non-electrolyte)

(d) Write proper numbers in place of * mark 1

$$^{10}_{5}B + {}^{4}_{2}He \longrightarrow {}^{*}_{*}N + {}^{1}_{0}n$$

(e) Name the substances according to property given below.

(i) Harder than silver in impure state but softer than silver in pure state.

(ii) Yellow when hot and becomes white when cold.

(f) Find the normality of hydrochloric acid solution if 7·3 gm of HCl is dissolved in one litre.

Q. 3 (a) Name the product left behind when following substances are heated : 1

(i) Sodium-nitrate (ii) Sora

(b) Write with chemical equation the effect of heat on potassium chlorate. 1

(c) What is the action of water on : 1

(i) Pure zinc (ii) Sodium oxide

(d) What should be done : 4

(i) To convert yellow P in to red P

(ii) To separate sulphur dioxide from dust particles

(iii) To prepare clean glass

(iv) To separate phosphorus from phosphorus pentaoxide

(e) " It is possible to estimate the age of animals or stones with the help of radioactive isotopes " Explain this statement 1

Q. 4 (a) Distinguish between each of the following. 4

(i) Conduction of electric current through metal and through the solution of electrolyte

(ii) Bombardment of neutrons on the nucleus of uranium and cadmium.

(iii) Action of dilute H_2SO_4 and con. H_2SO_4 on lead.

(iv) Action on sodium and potassium, when both are burnt in air.

(b) Give structural formulae of the following : 2

(i) Glucose (ii) Fructose.

(c) Find equivalent volume of hydrochloric acid having normality 0·2 N, if 30 ml of potassium hydroxide having normality 0·1 N is required for the neutralisation.

OR

(c) Find strength of 1·5 N sulphuric acid. 2

(H = 1, S = 32, O = 16)

Q. 5 (a) Give scientific reasons for :

(i) Hydrogen sulphide gas is used to detect arsenic poisoning,

(ii) Before galvonizing, metal sheet is dipped in HCl.

(iii) In the extraction of magnesium from magnesium chloride small quantity of NaCl is added to it.

(iv) Sodium-vapours are used to obtain powerful light.

(b) Answer any one of the following :

(i) How is red-lead prepared ?

(ii) Give two chemical and two physical properties of sodium hydroxide.

(iii) Give four features of Mendeleeff's periodic table.

(iv) How is ethyl–alcohol prepared from cane sugar by fermentation method?

PAPER 12

Q. 1 (a) Fill in the blanks with appropriate words given below and rewrite the sentences.

(i) Bleaching action of sulphur dioxide is due to–

(a) nescent sulphur (b) nescent oxygen.

(c) nescent hydrogen (d) nescent chlorine.

(ii) — is used as an anti poisonous substance in case of snake bite.

(a) $KMnO_4$ (b) KCl (c) KNO_3 (d) $KClO_3$

(iii) Two isomers have —

(a) same molecular formula.

(b) different molecular formulae.

(c) different numbers of oxygen atoms.

(d) different numbers of carbon atoms.

(iv) In structural formula of ethyl alcohol —

(a) carbon atoms are linked together with oxygen atoms.

(b) carbon atoms are linked together with hydrogen atoms.

(c) carbon atoms are linked together with carbon atoms.

(d) two carbon atoms are linked together by covalent bonds.

(b) Write molecular formula of a gas produced in the following reactions and also write chemical equations. 1

(i) $Zn + \text{dil. } HNO_3 \rightarrow$

(ii) $Na_2SO_3 + \text{dil. } H_2SO_4 \rightarrow$

(c) Write the name of catalyst used in the following reactions : 1

(i) Yellow P → Red P

(ii) Cane sugar → Glucose.

(d) Match the following :—

(i) Soft glass	(a) Hard
(ii) Optical glass	(b) Safety
(iii) Flint glass	(c) Refractive power
(iv) Pyrex glass	(d) low melting point
	(e) low coefficient of expansion
	(f) clean and bright

(e) Complete the following :— $\frac{1}{2}$

(Bromine) : (liquid state) : : (Mercury) : (?)

(f) Classify into acid and base 1

(i) Methyl orange becomes yellow.

(ii) Turmeric paper remains yellow.

Q. 2 (a) Select the features of electro-thermal process of extraction of phosphorus from the following :— 1

(i) Mixture of bone ash and coke.

(ii) Calcium phosphate, coke and sand.

(iii) Carbon electrodes.

(iv) Copper electrodes.

(v) Mixture of potassium dicromate and sulphuric acid.

(b) Which is the weak acid gas among CO_2, SO_2, Cl_2, H_2S ?

(c) Distinguish between each of the following, according to the property mentioned against them and write the name of the substance which is not resembling to that group. 1

(i) $CaCO_3$, $MgCO_3$, Na_2CO_3, $ZnCO_3$—— (soluble in water).

(ii) Ag_2S, CuS, HgS, ZnS — (colour). 1

(d) Write the proper numbers in place of * mark. 1

$$^{214}_{82}Pb \rightarrow {}^{*}_{83}Bi + {}^{-1}_{0}e$$

(e) Name the substance according to the property given below.

(i) Substance is used as an anti-poison in the poisoning of mercuric-chloride.

(ii) Substance is a salt of sodium and absorbs CO_2 and H_2O from air.

(f) How many grams of potassium hydroxide is required to prepare 0·2 N solution of potassium hydroxide in 500 ml ? 2

Q 3 (a) Name the product left behind after heating of the following substances : 1

(i) Mercuric oxide (ii) Magnesium sulphate.

(b) What is the action of water on : 1

(i) Crystalline silicon.

(ii) Crystals of Sodium hydroxide.

(c) Write with chemical equation the action of heat on red-lead. 1

(d) What should be done :

(i) To obtain yellow coloured light in the laboratory ? 1

(ii) To protect sodium from being attacked by air ? 1

(iii) To reduce harmful effect of snake bite ? 1

(iv) To protect phosphorus from being attacked by air ? 1

(e) ' Potassium chlorate is used as an oxidising agent ' Explain this statement. 1

Q. 4 (a) Distinguish between each of the following : 4

(i) Use of So_2 and Cl_2 as bleaching agent

(ii) Use of manganesedi-oxide and cobalt-oxide in preparaion of glass

(iii) Colour of chlorine and bromine.

(iv) Substances obtained when α-particles are lost from the nucleus of radium and radon.

(b) Give structural formulae of :

(i) Ethyl-hydrogen sulphate

(ii) Di-methyl-ether

(c) Find the equivalent volume of 0·15N NaOH soln. required for complete neturalisation of 20ml. solution of 0·5N·HCl. 2

OR

(c) Molecular formula of acetic acid is CH_3 COOH. Find its gram equivalent. How many grams of acid are required to prepare 0·1N solution of acetic acid in 500 ml ?

(C = 12, H = 1, O = 16).

Q. 5 (a) Give scientific reasons for :

(i) If concentrated sulphuric acid comes in contact with skin, it causes painful wounds.

(ii) Degree of dissociation increases if dilution is increased.

(iii) Silica is used as a refractory lining on the inside of furnace wall.

(iv) Nucleus of an atom is responsible for radio-activity.

(b) Answer any one of the following : 4

(i) What do you mean by titration ?
State the importance of indicators in titration.

(ii) How is washing soda prepared by Solvay's process ?

(iii) Write four properties of mercury.

(lv) Give method of preparation of glucose from starch.

PAPER 13

Q. 1 (a) Fill in the blanks with appropriate words given below and rewrite the sentences. 2

(i) Molecular formula of phosphorus is.....

(a) 4P (b) P (c) P_2 (d) P_4

(ii) The strength of 0·1N nitric acid is ..... gm/lit.

(a) 63 (b) 6·3 (c) 630 (d) 0·63

(iii) ..... is one of the property of lead glasst.

(a) Conductivity (b) Brightness (c) low coefficient of expansion (d) Refractive power

(iv) ..... absorbs neutrons.

(a) Uranium (b) Boron

(c) Polorium (d) Thorium.

(b) Match the following : 2

Group A	Group B
(i) Bleaching agent	(a) absorbs arsenic oxide
(ii) Dehydrating agent	(b) absorbs antimony oxide
(iii) Ferric hydroxide	(c) Vanadium pentaoxide
(iv) Contact process	(d) nitric-acid
	(e) sulphuric-acid
	(f) iodine.

Q. 2 (a) Write the molecular formula of gas produced in the following reactions and write the chemical equations — 1

(i) $NaHCO_3 + HCl \rightarrow$

(ii) $FeS + H_2SO_4 \rightarrow$

(b) What is the action of heat on : 1

(i) Potassium chlorate (ii) Red-lead.

(c) What happens when : (Write chemical equations of any two)— 2

(i) Mercury is heated in the atmosphere of chlorine.

(ii) Zinc-oxide is treated with hydrogen sulphide.

(iii) Solutions of ferric sulphate and sodium hydroxide are mixed together.

(iv) Hydrochloric-acid is poured on sodium.

(d) Complete the following : 1
(potassium chlorate) : (manganese di oxide) : : (yellow p) : (?).

(e) Write proper numbers in place of * mark. 1

$$^{210}_{84}Po \xrightarrow{-\propto} {}^{*}_{*}Pb$$

(f) Explain : (any two)
(i) Allotropes of silicon (ii) chain-reaction
(iii) uses of radioactive isotopes

(g) Distinguish between : 2
(i) Bleaching action of Cl_2 and bleaching action of SO_2
(ii) Yellow–P and red–P

Q. 3 (a) Give scientific reasons for : (any four) 4
(i) Fuse wire is made up of lead-alloy.
(ii) Close-contact with mercury vapour is dangerous.
(iii) Silver utensils are not used in laboratory.
(iv) Bazar salt becomes wet, if exposed to air.
(v) Sodium is kept under kerosene.

(b) What happens when the following substances are exposed to air ?
(i) Bleaching powder (ii) white-lead

(c) (i) Name blue coloured copper compound. 1
(ii) Name the inflammable substance used in safety matches.

(d) Find gram equivalent weight of nitric acid. 1

OR

(d) Find the strength of 0·1 N nitric acid.
(H = 1, N = 14, O = 16).

Q. 4 (a) (i) Answer any one of the following : 2

(a) How is phosphorus purified ?

(b) Give four properties of sodium hydroxide.

(ii) Name the constituents of " wood-metal ". 1
Also give its important use.

(b) (i) State four important uses of periodic table. 2

(ii) Give laboratory method of preparation of iodoform. 1

(c) (i) How is ethyl-alcohol prepared from ethylene gas ? 2

(ii) What is ' annealing ' ? 1

Q. 5 (a) (i) Define : ' Ionisation '. 1

(ii) For complete neutralisation of 20 ml solution of 0·2 N HCl, how much 0·15 N NaOH is required ?

OR

(ii) Find the normality of alkali, if 20 ml of NaOH is neutralised by 25 ml of 9·45 gm/lit. solution of sulphuric acid. 2

(b) Give structural formula of di-methyl ether. 1

(c) Answer the following : 2

(i) What is Rochelle's salt ?

(ii) Under what condition chlorine reacts with red phosphorus ?

(iii) State the symbots for chlorine, bromine and iodine.

(iv) What is Irish-diamond ?

(d) Write only observations in the following interactions. 2
(Equations are not expected).

(i) Turpentine paper is held in gas jar containing chlorine.

(ii) Sodium and mercury are mixed together.

(iii) Potassium is dropped in water.

(iv) H_2S gas is passed through acidified solution of potassium dicromate.

(e) Fill in the blanks :

(i) .... discovered that radioactive isotopes can be artificially prepared.

(ii) India made her first atomic-explosion in... at....

(iii) The colour of cadmium sulphide is....

PAPER 14

Q. 1 (a) Fill in the blanks with appropriate words given below and rewrite the sentences. 2

(i) If one of the protons from α- particle is removed then it becomes ...

(a) negatively charged. (b) positively charged.
(c) nucleus of helium.

(ii) To remove the impurities from mercury .... is used

(a) HNO_3 (b) $HCl + HNO_3$
(c) HCl (d) H_2SO_4.

(iii) .... gas is evolved when con. and hot sulphuric acid is poured on sodium chloride.

(a) Hydrogen sulphide
(b) Hydrogen chloride
(c) Sulphur di oxide (d) Sulphur trioxide.

(iv) .... is used as a fuel in 'Purnima' reactor.

(a) Thorium (b) Uranium
(c) Polonium (d) Plutonium-oxide.

(b) Match the following 2

Group A	Group B
(i) Red-lead	(a) purgative
(ii) lead-monoxide	(b) electrodes of accumulator
(iii) lead	(c) red oil-paint
(iv) Calomel	(d) to prepare red-lead
	(e) to protect wooden sleepers
	(f) used in ' tube-light '
	(g) used in dry-cell.

Q. 2 (a) Write the molecular formula of a gas produced in the following cases. 1

(i) $Zn + H_2SO_4 \rightarrow$ (ii) $NH_4Cl + NaOH \rightarrow$

(b) What is the action of heat on : 1

(i) Potassium permanganate

(ii) Bleaching powder

(c) What happens when : 2

(i) Sulphur dioxide and hydrogen sulphide gases are mixed.

(ii) Silica is treated with hydrofluoric acid.

(iii) Silver nitrate solution is added to Sodium chloride solution.

(iv) Zinc-oxide and caustic soda are mixed together.

(d) Complete the following : 1

$(MnO_2 + HCl) : (Cl_2) : : (NaCl + H_2SO_4) : (?)$

(e) Write proper numbers in place of * mark. 1

$$\overset{27}{\underset{13}{Al}} + \overset{4}{\underset{2}{He}} \rightarrow \overset{*}{\underset{*}{P}} + \overset{1}{\underset{0}{n}}$$

(f) Explain : (Any two) 2

(i) Acid in light of ionisation (ii) indicators

(iii) Carborandum.

(g) Distinguish between : 2

(i) Ionisation and dissociation

(ii) Chlorine and bromine

Q. 3 (a) Give reasons for the following :

(i) Atomic reactor have graphite walls.

(ii) Alloy magnalium is used in the manufacture of aeroplanes.

(iii) Potassium does not occur in free-state.

(iv) The colour of copper sulphate solution becomes faint after dissociation.

(v) Manganese di-oxide is used in the preparation of glass. 1

(b) What happens when following substances are exposed to air :— 1

(i) Zinc (ii) Caustic-soda.

(c) (i) Name the alloy used in the preparation of mirrors. 1

(ii) Name three hardest substances.

(d) Find gram equivalent of sulphuric acid. 1

OR

(d) How much grammes of sulphuric acid will be required to prepare 0·1 N solution in 250 ml.

(H = 1, O = 16, S = 32).

Q. 4 (a) (i) Answer any one of the following : 2

(a) How is purification of cane-sugar juice brought about ?

(b) Give four properties of potassium permanganate.

(ii) Give the constituents of 'phospher-bronze' and mention its use.

(b) (i) Give four features of Mendeleeff's periodic table. 2

(ii) How is red phosphorus prepared from yellow phosphorous ?

(c) (i) Give method of preparation of glucose from starch. 2

(ii) How is ' pyrex glass ' prepared ? 1

Q. 5 (a) (i) 20 ml. of NaOH is required for complete neutralisation of 30 ml. of 0·1 N HCl. Find the normality of NaOH. 2

OR

(i) Find equivalent volume of 0·15 N NaOH required for the neutralisation of 15 ml. of HCl having strength 3·65 gm/lit. 2

(ii) Name the substances used in the safety-matches. 1

(b) Write structural formula of glucose. 1

(c) Answer the following :

(i) Which particle is used in ' irradiation ' ?

(ii) What is the name given to ' germanium ' by Mendeleeff ?

(iii) How is safety glass prepared ?

(iv) Which glass is used to preserve eggs ?

(d) Write only observations in the following cases. 2

(i) Yellow phosphorus is dropped in turpentine.

(ii) Burning candle is held in the gas jar containing H_2S.

(iii) Bromine gas is passed through potassium iodide solution.

(iv) Crystals of epsum-salt are heated.

(e) Fill in the blanks. 2

(i) .... is the present chairman of Atomic Energy Commission.

(ii) .... gas is evolved during fermentation.

(iii) Chlorine is used to prepare ...., a constituent of tear gas.

(iv) Sulphur di oxide is collected by .... method.

PAPER 15

Q. 1 (a) Fill in the blanks with appropriate words given below and rewrite the statements.

(i) SO_2 is passed through juice of cane sugar beacuse...

(a) juice becomes colourless and clean.

(b) mixture gets stirred.

(c) juice gets reduced.

(d) calcium-carbonate is separated from mixture.

(ii) .... is the first atomic reactor in India.

(a) Purnima (b) Zerlina (c) Cerus

(d) Apsara

(iii) Mercury .... at 375°C.

(a) vaporises. (b) sublimates

(c) boils (d) decomposes

(iv) .... is used in the preparation of 'type-metal'.

(a) Mercury (b) Zinc

(c) Lead (d) Sodium

(b) Match the following. : 2

Group A	Group B
(i) Conversion of 'Nira' into 'Tari'	(a) neutralisation
	(b) crystallisation
(ii) Separation of sodium chloride from its solution	(c) dissociation
	(d) hydrolysis

(iii) conversion of cane sugar into glucose
(iv) Formation of salt and water from caustic soda and hydrochloric-acid
(e) ionisation
(f) decomposition
(g) fermentation.

Q. 2 (a) Write molecular formula of gas produced in each of the of following reactions. 1

(i) $Mg + Con.\ H_2SO_4 \rightarrow$

(ii) $NaCl + Con.\ H_2SO_4 \rightarrow$

(b) What is the action of water on : 1

(i) Sulphur tri oxide (ii) Magnesium

(c) What happens when following substances are exposed to air : 1

(i) Yellow phosphorus (ii) Magnesium chloride.

(d) Classify into acid and alkali. 1

(i) Phenolphthalein becomes colourless.

(ii) Methyl-orange becomes red.

(e) Write with the help of chemical equation the effect of heat on red-lead. and write the names of products. 1

(f) Name the substances used to prepare following gases in the laboratory. 1

(a) Hydrogen sulphide (b) Chlorine.

(g) Write the names of following ores 1

(i) KNO_3 (ii) $KCl.\ MgCl_2.\ 6H_2O$.

Q, 3 (a) (i) How is tincture iodine prepared ?

(ii) From the HCl fountain, which two properties are confirmed ?

(b) Explain : (any two)

(i) Cold flame (ii) Dehydrating agent

(iii) Soft glass

(c) Distinguish between :- 4

(i) Flame test for sodium and potassium

(ii) Action of dilute sulphuric acid on zinc and action of hot con. sulphuric acid on zinc

(iii) Silicon carbide and Diamond

(iv) Mendeleeff's periodic table and modern periodic table.

(d) State how will you prepare the following ? 2

(i) Magnesium chloride from magnesium oxide.

(ii) Calomel from mercury (II) chloride.

Q. 4 (a) (i) For complete neutralisation of 20 ml. solution of sodium hydroxide 25 ml. solution of hydro chloric acid of the strength of 3·65 gm/lit. is required. Find the normality of sodium hydroxide solution $1\frac{1}{2}$

OR

(i) When 50 ml. solution of sodium hydroxide is evaporated 0·4 gm of hydroxide is obtained. Find the normality of hydroxide. $1\frac{1}{2}$

(ii) Write in the ascending order of strongness : $\frac{1}{2}$
H_2SO_4, HCl and HNO_3.

(b) (i) Answer any one of the following : 2

(a) How will you prepare glucose from cane sugar ?

(b) Give four uses of mercury.

(ii) In extraction of phosphorus, how are carbon monoxide vapours separated from phosphorus vapours ? 1

(c) Find gram equivalent weight of caustic soda. 1
(Na = 23, K = 39, H = 1, O = 16, N = 14).

(d) Select the features of graph of Lother Meyer from the following :

(i) Light metals are at the apex of the wave.

(ii) Easily melting substances are on the ascending slope.

(iii) Elements having high melting points are located at the lowest point of the wave.

(iv) There are eight elements on each wave.

(e) (i) Draw neat and labelled diagram : (any one) 1

(a) Kipp's apparatus

(b) Controlled chain reaction.

(ii) Give ball and stick model of di-methyl ether. 1

Q. 5 (a) Give scientific reasons for : 4

(i) White carpets look blackish after some months.

(ii) Yellow phosphorus is not used in safety matches.

(iii) Starch iodide paper turns blue when held in Cl_2

(iv) There is no place for inert gases in Mendeleeff's periodic table.

(b) (i) Give laboratory method of preparation of hydrogen chloride gas. 2

(ii) Give an account of preparation of glass. 2

(c) Fill in the blanks.

(i) Enzymes are ....

(ii) ..... is a charge on cation.

(iii) Hydrochloric acid was discovered by ....

(iv) Biggest thermal power station in Maharashtra is at....

PAPER 16

Q. 1 (a) Give scientific reasons for : (any four) 4

(i) Potassium di-cromate is used in match stick.

(ii) Sulphuric acid is called " King of chemicals."

(iii) Electric current does not flow through crytsals of copper sulphate.

(iv) Unhydrous $MgCl_2$ can be electrolysed in the atmosphere of coal-gas

(v) Lead is used in the preparation of ' Soldcr-metal '

(vi) Lead pipes are not used to carry drinking water.

(b) In group A certain gases are given and in group B their properties are given. Match the pairs. 2

Group A	Group B
(i) Chlorine	(a) Helps for burning of
(ii) Hydrogen choride	hydrocarbon
(iii) Hydrogen sulphide	(b) acidic
(iv) Sulphur di oxide	(c) prepares sulphide
	(d) strong reducing agent

(c) Name the substance according to given property. 1

(i) Violet coloured element soluble in potassium iodide.

(ii) Non-metal-which is in liquid state at normal temperature.

(d) Match the following : 2

Group A	Group B
(i) No action of dil H_2SO_4	(a) Sodium carbonate
	(b) Sodium bicarbonate
(ii) Malleable and ductile	(c) Mercury
(iii) Greenish coloured gas is evolved when con. HCl is poured	(d) Zinc
	(e) Sodium
	(f) Potasium

(iv) Efflorescent-substance (g) Potassium permanganate
(h) Potassium chlorate

Q. 2 (a) Give molecular formula of the gas evolved. 1

(i) $Ca(OH)_2 + NH_4Cl \rightarrow$

(ii) $ZN + Con.\ HNO_3 \rightarrow$

(b) What is the effect of heat on :

(i) Potassium nitrate (ii) Red-lead

(c) What happens when following substances are exposed to air ? 1

(i) Washing-soda (ii) Bleaching powder.

(d) (i) Name two reducing agents which you have studied. 1

(ii) Name the sulphide having white colour.

(e) Name the indicators used in the titration of following :

(1) H_2SO_4 and NaOH

(2) Acetic-acid and ammonium hydroxide.

(f) Name the constituents of following alloys : 1

(i) Fuse-wire (ii) Type-metal

Q. 3 (a) (i) Answer any one of the following :—

(a) Write short note on. 'Bleaching action' of Cl_2

(b) Write the chemical changes that take place when electric current flows through copper sulphate solution.

(ii) Explain : " Half-life of Ra is 1600 years." 1

(b) Fill in the blanks with appropriate words given below.

(i) concentration of acid depends on —

(a) dissociation of acid.

(b) density of acid.
(d) amount of water present in acid.
(d) ionisation of acid.

(ii) Glucose is used to silver the glass because —
(a) it is an oxidising agent.
(b) it is a reducing agent.
(c) it is a mordant.
(d) it is a carbohydrate.

(iii) — gas is evolved when con. H_2SO_4 is poured on mercury.
(a) H_2S (b) SO_2 (c) SO_3 (d) H_2

(iv) Chlorine water is —
(a) neutral. (b) acidic.
(c) amphoteric. (d) basic.

(c) Explain : (any two)
(a) Absolute alcohol (b) Rinmann's green
(c) Law of octaves

(d) Equivalent weight of H_2SO_4 is 49 gm. How much acid will be required to prepare 0·5N soln. of H_2SO_4 in one litre ? 1

Q. (a) 4 (i) How is ' coloured glass ' manufactured ? 2
(ii) What is ' annealing ' ?

(b) (i) How is lead extracted from galena ? 2
(ii) How is iodoform prepared in laboratory ? 1

(c) (i) How is glucose prepared from ethylene gas ? 2
(ii) How are radio-active isotopes are prepared ? 1

(d) Calculate equivalent volume of 0·15 N sodium hydroxide solution required for complete neutralisation of 30 ml. solution of N/2 hydrochloric acid. 2

Q. 5 (a) Draw a neat and labelled diagram : (any two) 3
(i) Electric furnace for extraction of phosphorus

(ii) Ball and stick model of ethyl alcohol

(iii) Purification of mercury.

(b) *Fill in the blanks.* :

(i) The biggest atomic reactor in Maharashtra is at —

(ii) Grinding wheels are made of —

(iii) Taste of acid is —

(iv) Equivalent weight of carbonic acid is 62 gm. Its gram equivalent weight is —

———

PAPER 17

Q. 1 (a) Fill in the blanks with appropriate words given below and rewrite the statement.

(i) Yellow phosphorus when heated at — °C, gets converted into red phosphorus, 2

(a) 34 (b) 48 (c) 180 (d) 250

(ii) When glass is plated with the alloy of tin and mercury —

(a) it becomes hard.

(b) its refractive power increases.

(c) light gets reflected from glass.

(d) light rays are absorbed by the glass.

(iii) Radium is discovered by —

(a) Pierie Curie (b) Marie Sklodovoska

(c) Eve Curie (d) Irene Curie.

(iv) Hydrolysis of starch produces —

(a) glucose (b) cane sugar (c) Fructose

(d) barly sugar.

(b) Match the following : 2

Group '-A'	Group ' B '
(i) Bengal salt peter	(a) sodium cyanide
(ii) Chili salt peter	(b) sodium nitrate
(iii) Photoelectric cell	(c) potassium nitrate
(iv) Extraction of soda	(d) silver plating
	(e) sodium plating
	(f) potassium plating
	(g) potassium cyanide

Q. 2 (a) Write molecular formula of the gas produced and write chemical equation : 1

(i) FeS + dil. HCl →

(ii) Hg + con. HNO_3 →

(b) What is the action of water on : 1

(i) Potassium (ii) Chlorine gas

(c) Write with the help of chemical equation effect of heat on sora. 1

(d) Give simple identification property of : $\frac{1}{2}$

(i) Starch (ii) Hydrogen sulphide gas.

(e) What happens when following substances are exposed to air — $\frac{1}{2}$

(i) Sulphuric acid (ii) Red phosphorus.

(f) Name the substances used to prepare the following :

(i) Red-lead (ii) Carossive sublimate 1

(g) Name the following ores : 1

(i) $NaNO_3$ (ii) $MgCO_3$, $CaCO_3$

Q. 3 (a) (i) How is Fehling's solution prepared ?

(ii) " When sulphur di oxide is passed in the solution of hydrogen sulphide gas in water, solution becomes yellow, "

What does this indicate ? 1

(b) Explain : (any two)

(a) Control-rods (b) Half life

(c) Co^{60}

(c) Distinguish between :

(i) Crystalline silicon and amorphous silicon

(ii) Bleaching action of Cl_2 and bleaching action of So_2

(d) How will you prepare the following ? 2

(i) Safety glass (ii) Lead-sulphate from lead

Q. 4 (a) (i) Equivalent weight of sodium hydroxide is 40 gm. How much grams of sodium hydroxide should be dissolved in 250 ml of water to obtain 0·25N solution of sodium hydroxide ? $1\frac{1}{2}$

OR

(i) 20 ml. of H_2SO_4 is required for the neutralisation of 0·5N NaOH. If strength of H_2SO_4 is 0·49 gm/lit. find equivalent volume of NaOH. $1\frac{1}{2}$

(b) Answer any one of the followtng : 2

(a) Give method of preparation of glucose from strach.

(b) (i) Give four properties of potassium.

(ii) In Solvay's process carbon di oxide gas is passed in the solutin of sodium chloride saturated with ammonia under pressure. Give reason for this. 4

(c) Find gram equivalent weight of CH_3COOH.

(d) What should be done :

(i) To separate mixture of gases from dust particles.

(ii) To remove excess chlorine from bleached cloth.

(e) (i) Draw neat and labelled diagram : (any one). 1

(a) Fountain of Hydrogen chloride gas

(b) Hansen Clever's plant.

(ii) Give structural formula of ethyl-hydrogen sulphate

Q. 5 (a) Give scientific reactions for : 4

(i) Lime is added to the juice of cane sugar.

(ii) Calomel should be very pure.

(iii) Sodium is used as a reducing agent.

(iv) Ammonium hydroxide is a weak alkali.

(b) (i) Give contact-process of manufacture of sulphuric acid.

(ii) Write four properties of glass. 2

(c) Fill in the blanks : 2

(i) Chain reaction was discovered by ....

(ii) Molecular formula for radioactive phosphorus is . . .

(iii) Starch iodide paper turns .... due to bromine.

(iv) Potassium burns in air with .... colour

BIOLOGY

PAPER 1

Q. 1 (a) Fill in the gaps by selecting one suitable alternative out of the four alternatives given at the end of each statement and rewrite the completed statements. 5

(i) —— increases in size due to deficiency of iodine.

(a) Pituitary posterior lobe
(b) Pituitary anterior lobe
(c) Thyroid gland (d) Thymus gland.

(ii) First antibiotics was discovered by —

(a) Dr. Fleming (b) Pasteur
(c) Dr. Bose (d) Darwin

(iii) Reproductive cell of onion has——chromosomes.

(a) 16 (b) 46 (c) 23 (d) 8

(iv) —— is an excretory product, found in the cells.

(a) Haemoglobin (b) Gum
(c) Nectar (d) Calcium Carbonate

(v) In —— part of one plant is made to unite with another.

(a) Cutting (b) Gootee
(c) Layering (d) Crown grafting

(b) Match the pairs 3

A (Scientists)	B (Principle)
(a) Darwin	(1) Mutation
(b) Lamarck	(2) Variation
(c) Hugo Devries	(3) Use and disuse theory
	(4) Dominance and recessiveness of gene.

Q. 2 Give scientific reasons for any five of the following : 5

(i) Wind pollinating flowers pollen grains are produced in large amount.

(ii) Reproductive cells are always haploid.

(iii) Defect of short sight is corrected by use of concave lens.

(iv) The percentage of nitrogen in air is always constant.

(v) The mule is unable to reproduce.

(vi) Sense of touch is not acute all over the skin.

(vii) Vegetetive methods are adopted for the propogation of good varities of mango.

(b) Give three examples of physical and biological factor of enviourment 3

OR

(b) Give three differences between natural and artificial ecosystem. 3

Q. 3 Attempt any four of the following : 8

(i) Write in brief about malarial parasite.

(ii) Write two differences between Nitrifying and Denitrifying bacteria.

(iii) Write a note on rocks found in the Earth crust.

(iv) Explain with illustrations two responses found in living organisms.

(v) Write disadvantages from hygienic point of view :

(a) Taking no rest after Typhoid fever.

(b) Use of leaking pipes for water supply.

Q. 4 Attempt any four of the following : 8

(i) What are the preventive measures, adopted for small pox ?

(ii) Compare the vacuoles in plant and animal cells.

(iii) How will you identify ?
(a) Arterial bleeding. (b) Fainting.

(iv) Write two functions of Brain stem.

(v) What are the different agents of pollination ? Write one example of each.

Q. 5 (a) Draw a neat figure of mitochondria and label following parts :
(a) Membranes (b) Cristae. 3

(b) Write three differences between sedimentary and igneous rocks. 3

(c) Draw a figure showing movement in cytoplasm in tradescantia cells. 2

PAPER 2

Q. 1 (a) Fill in the blanks by suitable alternative and rewrite the statement.

(1) Pituitary gland is situated 5
(a) at the base of brain (b) in the neck region (c) in the thorax (d) near stomach

(2) Pox vaccine was discovered by ....
(a) Pasteur (b) Ronald Ross
(c) Robert Kock (d) Edward Jennar

(3) Nectar in flower is ....
(a) Reserved food (b) Excretory product
(c) Secretory product (d) Un wanted substance.

(4) The crystals in banyan leaf are made up of..
(a) Glycogen (b) Calcium Carbonate
(c) Calcium oxalate (d) Gum.

(5) .... is the advantage of vegetative propogation in case of Banana plant.

(a) Improvement in quality of fruit

(b) Increase in number of fruit

(c) Early bearing of fruits

(d) Propogation of sterile plant

(b) Match the pairs. 3

A (scientist)	B (study undertaken)
(i) Mendel	(a) study of reproduction in
(ii) Hugo De Vries	livingbeing.
(iii) Darwin	(b) study of alleles.
	(c) study of O. lamarckiana plant
	(d) study of evolution in Giraffe.

Q. 2 (a) Give scientific reasons for any five of the following : 5

(i) Night Queen flower has attractive smell.

(ii) Heredity is associated with nucleus.

(iii) Some people use cylendrical lenses.

(iv) Denitrifying bacteria are harmful from agriculturist's point of view

(v) Deformities in the progeny of people affected by atomic explosion, persisted in next generation.

(iv) Internal ear is helpful for maintaining balance.

(vii) Vegetative propogation is both advantegeous and disadvantegeous process.

(b) Suggest three ways for conservation of nature. 3

OR

(b) Write three important phases of man's attempt to control environment. 3

Q. 3 Attempt any four of the following. 8

(i) Suggest three means to prevent mosquito bite.

(ii) Write three differences between clay and sand.

(iii) Write two functions of plasma membrane

(iv) What is complicated fracture ? What are the main signs of bone fracture ?

(v) Write four danger signals of cancer.

Q. 4 Attempt any four of the following. : 8

(i) Write four symptoms of Tuberculosis.

(ii) What are the three changes taking place during growth ?

(iii) Write in brief about the plant life in Mesozoic era.

(iv) Write two functions of Brain.

(v) Write differences between External fertilization and Internal fertilization.

Q. 5 (a) Draw a typical plant cell and label following. parts. 4

(i) Mitochondria (ii) Nucleus
(iii) Vacuole (iv) Cell wall

(b) Write an experiment to demonstrate that stem grows towards light. 4

PAPER 3

Q. 1 (a) Fill in the blanks by suitable alternative and rewrite the statement.

(i) Femal has .... combination of sex chromosomes.
(a) XY (b) YX (c) XX (d) YY

(ii) The ratio of sugar group, phosphate, and nitrogen base in one nucleotide is.....
(a) 1 : 1 : 1 (b) 1 : 1: 4
(c) Many : Many : Many (d) 3 : 3 : 3.

(iii) There is no nervous system in.....
(a) Hydra (b) Frog
(c) Cockroach (d) Sunflower.

(iv) .... is situated in the posterior part of brain.

(a) Optic Centre (b) Auditory Centre
(c) Olfactory Centre (d) Centre of speech

(v) .... is an example of reproductive cell.

(a) Nerve cell (b) Muscle cell
(c) Bone cell (d) Ovum.

(b) Match the pairs. 3

A (Type of fossil)	B (Examples)
(i) Cast	(a) Graphite.
(ii) Rocks of organic origin	(b) Stigmaria.
(iii) Impression	(c) Sporangia.
	(d) Neuropteris.

Q. 2 (a) Give scientific reasons for any five of the following. 5

(i) Effects of fertilizers are readily seen.

(ii) Vaccination sometime leads to mild fever.

(iii) Manures are supplied at the time of tillage and not at the time of cultivation.

(iv) Aquatic animal die in polluted water.

(v) Large doses of vitamins should be taken during the epidemic of influenza.

(vi) Tourniquet should not be applied for long time.

(vii) There is no sensation over leprosy patch

(b) Write three uses of marine algae. 3

OR

(b) Write the names of inventions done by Pasteur, J. Bose, and Darwin.

Q. 3 Attempt any four of the following : 8

(i) Write in brief about the three changes occuring during the growth.

(ii) Write a short note on Bud grafting

(iii) What are the three advantages of hybridization ?

(iv) Write in short the distribution of plant life in different eras.

(v) Give four symptoms of Jaundice

Q. 4 Attempt any four of the following. :

(i) Write two possible causes and two curative measures for cancer.

(ii) Write various types of plastids and give function of leucoplasts.

(iii) What is dislocation of joint ? What first aid should be given in sush case ?

(iv) Write a note on effect of gravity stimulus on growth of the plants.

(v) Write the functions of the skin.

Q. 5 (a) Draw a figure of typical flower and label following parts.

(i) Pollen sacs (ii) Anther (iii) Calyx.

(b) Draw the figures of pollen grains of maize and Ipomea. 3

(c) Give definitions of :

(i) Micronutrients (ii) Pasteurization 2

PAPER 4

Q. 1 (a) Fill in the blanks with appropriate alternative given below and rewrite the sentence—

(i) The part of nasal cavity concerned with smell is.....

(a) Vertical septum (b) Inner lining

(c) Lower surface (d) Roof.

(ii) There are .... chromosomes in somatic cells of frog.

(a) 23 (b) 26 (c) 48 (d) 46

(iii) .... is effective medicine on Tuberculosis.

(a) Streptomycin (b) Chloromycetin
(c) Chloroquinne (d) Dapsone

(iv) The basic factor determining the growth of man is ....

(a) Hormone (b) Enzyme
(c) Gene (d) Food

(v) .... has discovered malarial parasite.

(a) Robert Kock (b) Ronald Ross
(c) Guerin (d) Dr. Hansen

(b) Match the pair

A (vegetables)	B (Improved varities)	3
(i) Tomato	(1) Pusa Kanti	
(ii) Bringal	(2) Pusa Savani	
(iii) Potato	(3) Pusa Rubi	
	(4) Kupari Chandramukhi	

Q. 2 (a) Give scientific reasons for any five of the following : 5

(i) Bleeding from the capillaries in slow oozing and red pink.

(ii) Grafts are made in the varieties of the same species.

(iii) The nerve endings get bulged up at lips.

(iv) Endosperm is important part of seed from germination point of view.

(v) Housefly is dangerous animal.

(vi) All living organisms try to reproduce as much as they can.

(vii) The Plant cells become turgid.

(b) Give the classification of mineral matter based on the size of the particles 3

OR

(b) What are the four advantages of tillage ? 3

Q. 3 Attempt any four of the following : 8

(i) What is endoplasmic reticulum ? Explain the structure of it.

(ii) What is regeneration ? Give two examples of regeneration.

(iii) Write the names of parts of brain stem.

(iv) What is fossil ? Write a note on coal balls.

(v) What are the organs more susceptible to cancer ?

Q. 4 Attempt any four of the following : 1

(i) Write four preventive measures to be adopted in respect of infectious disease.

(ii) Write four differences between plant and animal cell.

(iii) Compare Bleeding from artery and Bleeding from veins.

(iv) Write two functions of Brain Stem.

(v) Write a brief note on fertilization.

Q. 5 (a) Draw a neat figure of internal ear and label the followings : 3

(i) Semicircular Canal (ii) Auditory nerve

(iii) Cochlea

(b) Draw a neat diagram of spirogyra cell and label following parts. 3

(i) Cell wall (ii) Pyrenoid (iii) Chloroplast. 2

(c) Write two differences between male and female gamates

PAPER 5

Q. 1 (a) Fill in the blanks with appropriate alternative given below and rewrite the statement.

(i) Salty taste is sensed .... of tongue. 5

(a) at the tip (b) at the back side

(c) at the middle part (d) on the sides

(ii) In the somatic cells of tobacco plant there are .... chromosomes.

(a) 23 (b) 26 (c) 46 (d) 48

(iii) .... is an effective medicine on malaria

(a) Streptomycin (b) Chloromycetin

(c) Chloroquine (d) Dapsone

(iv) .... has discovered germs of Tuberculosis.

(a) Robert kock (b) Ronald Ross

(c) Guerin (d) Hanson

(v) During the growth the rate of anabolism is .... katabolism

(a) more than (b) equal to

(c) less than (d) very less than,

(b) Match the pairs 3

A (Cereals)	B (Improved varities)
(i) Rice	(a) Maldandi
(ii) Jawar	(b) Suhasini
(iii) Wheat	(c) Niphad
	(d) Ranjit

Q. 2 (a) Give scientific reasons for any four of the following : 5

(i) The part of fractured limb is supported by wooden plank.

(ii) Cuttings are always treated with IAA.

(iii) Different portions of skin send different sensations.

(iv) Patient of cholera is kept on saline.

(v) Variations play important role in species formation.

(vi) Plants growing in darkness have weaker stem.

(vii) In plant cells the nucleus is pushed towards wall.

(b) Write four benefits of Humus from agricultural point of view. 3

OR

(b) Explain the process of hybridization taking example of maize. 3

Q. 3 Attempt any four of the following : 8

(i) Write the names of three inorganic salts and give one use of each to the plants.

(ii) Give the primary functions of the stem.

(iii) What are the natural means of protecting eyes ?

(iv) What are fossils ? Write a note on cast.

(v) Write four symptoms of leprosy.

Q. 4 Attempt any four of the following : 8

(i) Write four preventive measures for Typhoid.

(ii) What do you mean by cell organelles and cell inclusions ? Give two examples of each.

(iii) What is a pressure point ? How will you identify pressure points ?

(iv) Write the observations on which Darwins theory is based and explain each point.

(v) Write a short note on layers of Earth crust.

Q. 5 (a) Draw a neat figure of Neuron and label following parts. 3

(a) Cytoplasm (b) Nucleus

(c) Dendrites (d) Medullary sheath

(b) Draw a vertical section of Banyan leaf showing excretory product. 3

(c) Define : 2

(a) Endocrine gland (b) Persistence of vision.

PAPER 6

Q. 1 (a) Fill in the blanks with appropriate alternative given below and rewrite the sentence :

(i) At the sides of the tongue ..... taste is sensed.

(a) Sweat (b) Sour

(c) Salty (d) Bitter.

(ii) There are .... chromosomes in sometic cells of maize.

(a) 20 (b) 23 (c) 26 (d) 46

(iii) .... is an effective medicine on leprosy.

(a) Streptomycin (b) Chloromycetin

(c) Chloroquine (d) Dapsone

(iv) .... has discovered germs of Leprosy.

(a) Robert kock (b) Dr Ronald Ross

(c) Dr. Hanson (d) Guerin.

(v) ....is the horomone responsible for flowering.

(a) IAA (b) NAA

(c) Gibberellin (d) Florigen

(b) Match the pair. 3

A (Bacteria)	B (Function)
(i) Symbiotic bacteria	(a) To transform ammonia into nitrite
(ii) Azota bactor	
(iii) Nitro somonas.	(b) To transform nitrogen into ammonia

(c) To transform nitrites into nitrates.
(d) To transform nitrogen into nitrates.

Q. 2 Give scientific reasons for any five of the following : 5

(i) Ice is applied on swollen and affected area.

(ii) In rose there is no sexual reproduction.

(iii) In between the Archinoid and piamater there is cerebrospinal fluid.

(iv) Growth is not mere increase in size and weight.

(v) Eyes of outer skin, of jaundice patient appear yellow.

(vi) Inheritance of acquired character is disputable principle.

(vii) The shape of plant cell is definite.

(b) Where do you find symbiotic bacteria ? How are they useful to plants ? 3

OR

(b) Write four forest products useful for man. 3

Q. 3 Attempt any four of the following : 8

(i) Explain how cell is the basic unit of living beings.

(ii) Write primary functions of leaf.

(iii) What are the phases of the growth ? Write the changes taking place in each phase.

(iv) What is fossil ? How are the impression formed ?

(v) Write four main symptoms of small pox.

Q. 4 Attempt any four of the following : 8

(i) Write four preventive measures for jaundice.

(ii) What are the functions of vacuole ?

(iii) Write advantages of (a) Notification (b) Isolation

(iv) Explain how nose acts as a sense organ.

(v) Write a brief note on changes taking place in nucleii of ovule and pollen grain before fertilization.

Q. 5 (a) Draw a V.S. of brain and label following parts.
(a) Cerebrum (b) Cerebellum (c) Medulla oblongata (d) Spinal cord

(b) Draw a figure showing movement of cytoplasm in hydrilla cell.

(c) What is double fertilization ? What are the benefits of it ?

PAPER 7

Q 1 (a) Fill in the blanks with appropriate alternative given below and rewrite the sentence.

(i) ..... is known as queen of glands.
(a) Pituitary gland (b) Thyroid gland
(c) Thymus gland (d) Pancreas.

(ii) ..... was first to study cell.
(a) Robert Hook (b) Dr. Birbal Sahani
(c) Jagdishchandra Bose (d) Pasteur

(iii) Percentage of .... is maximum among all constituents of protoplasm.
(a) Proteins (b) Fat
(c) Carbohydrates (d) Water.

(iv) Folded membranes are seen when .... is observed under electron microscope.
(a) Cytoplasm (b) Endoplasm
(c) Ectoplasm (d) Protoplasm.

(v) Root of .... performs the function of vegetative reproduction.
(a) Clerodendron (b) Canna
(c) Turmeric (d) Oxalis.

(b) Match the pairs.

A (Principle)	B (Events)
(i) Mutation	(i) Degeneration of human tail
(ii) Struggle for existence	(ii) Big fish eats up tiny fish
(iii) Use and disuse theory	(iii) A plant producing white flowers produces red.
(iv) Dominance and recessiveness of gene.	

Q. 2 (a) Give scientific reasons for any five of the follwing : 5

(i) Flowers of grass are without smell and colour.

(ii) After division of somatic cell the number of chromosomes in new cell remains constant.

(iii) Image fallen on blind spot is not transmitted to the brain.

(iv) Nitrogen is consider to be most important constituent of diet.

(v) Structure of nose differs even in two brothers

(vi) In middle ear opens the eustachian tube.

(vii) All parts of plant can not perform the function of vegetative propogation.

(b) ' Pollution is a curse to modern age ' Discuss in brief 3

OR

(b) Write three main problems before modern man. 3

Q. 3 Attempt any four of the following : 8

(i) Write in brief the structure of DNA molecule and explain how it is useful from genetic point of view.

(ii) Write brief notes on oogenesis and spermatogenesis.

(iii) Write the names of different kinds of fossils.

(iv) Explain-doctrine of spontaneous creation.

(v) What are the common misconceptions about leprosy ?

Q. 4 Attempt any four of the following : 8

(i) Write four preventive measures for jaundice.

(ii) Write the constituents of protoplasm and their percentage in it.

(iii) What first aid will you render when blood comes out in spurts ?

(iv) Write the names of bacteria taking part in nitrogen cycle and give role of each.

(v) Write differences between manures and fertilizers.

Q. 5 (a) Draw a figure of spirogyra cell and label following parts : 3

(i) Chloroplast (ii) Nucleus

(b) Draw vertical section of eye and label following parts : 2

(i) Lens (ii) Retina

(c) Classify following fossils : 3

(i) Coal (ii) Amber

(iii) Neocalamite (iv) Neuropteris.

PAPER 8

Q. 1 (a) Fill in the blanks by suitable alternative and rewrite the statement.

(i) At the tip of tongue .... taste is sensed. 8

(a) Sweet (b) Sweet and salty

(c) Sour and salty (d) Sour

(ii) Isoniazide is an effective medicine on....

(a) Tuberculosis. (b) Jaundice.

(c) Malaria. (d) Cancer.

(iii) .... and ....discovered preventive vaccine on T. B.

(a) Ronald Ross and Calmatte

(b) Robert Kock and Guerin

(c) Robert Cock and Ronald Ross

(d) Calmatte and Guerin

(iv) .... a synthetic hormone, controls the growth of the plants.

(a) IAA (b) NAA (c) Gibberallin

(d) Morphactin.

(v) Somatic cell of .... has 48 chromosomes.

(a) Onion (b) Tobacco

(c) Maize (d) Rice

(b) Match the pairs. 3

Era	Distribution of animal
(i) Proterozoic	(a) Mammals
(ii) Cenozoic	(d) Arthropodas
(iii) Paleozoic	(c) Amoebar
(iv) Archeozoic.	

Q. 2 (a) Give scientific reasons for any five of the following : 5

(i) Fainted patient should be made to lie down on cot with foot end raised.

(ii) Urinogenital duct is found in male frog.

(iii) The person whose right hand side is paralized can not speak.

(iv) The growth curve is always sigma shaped.

(v) Patients of small pox some time go blind.

(vi) We do not find kangaroo in Asiatic region.

(vii) Magnesium salt are essential for plant.

(b) Write the names of four kinds of pollutions in industrialised city. 3

OR

(b) Write the uses of marine algae with one example of each.

Q. 3 Attempt any four of the following: 8

(i) Why is excretion considered essential life process ? Write excretory products in case of animals.

(ii) Write a note on Gootee

(iii) Write three effects of temperature on growth of the plants.

(iv) What are fossils ? Write a note on Rock and minerals of organic origin.

(v) Write four symptoms of Influenza.

Q. 4 Attempt any four of the following: 8

(i) Write four preventive measures for maleria.

(ii) What are the two types of vacuoles found in animal cells ? Write functions of each.

(iii) Write the names of various types of bone fractures and give an example of each.

(iv) Write two functions of cerebellum.

(v) Write difference between somatic and reproductive cells.

Q. 5 (a) Draw a neat figure of amoeba and label following parts. 6

(i) Contractile vacuole (ii) Pseudopodia

(iii) Food vacuole (iv) Nucleus

(b) Define (i) Petrification (ii) Pollination. 2

PAPER 9

Q. 1 (a) Fill in the blanks with appropriate alternative and rewrite the statement :

(i) Bitter taste is sensed at .... of tongue. 5

(a) the tip (b) the sides
(c) the middle (d) the posterior end

(ii) .... has twenty chromosomes.

(a) Man (b) Frog (c) Dog (d) Amoeba.

(iii) PAS is an effective medicine on ....

(a) T.B. (b) Malaria
(c) Cancer (d) Jaundice

(iv) Dr. Edward Jennar has discovered vaccine on ...

(a) Tuberculosis. (b) Small pox.
(c) Cholera. (d) Leprosy.

(v) Due to .... size and weight of fruit increases.

(a) IAA (b) NAA (c) Florigen
(d) Gibberallin.

(b) Match the pairs : 3

(1) Era	(i) Distribution of plants
(2) Paleozoic	(ii) Bacteria
(3) Proterozoic	(iii) Flowering plants
(4) Mesozoic	(iv) Pteredophyta
(5) Archeozoic	

Q. 2 (a) Give scientific reasons for any five of the following : 5

(i) Patient of fainting should not be given any food.

(ii) During breeding season the size of the female frog increases.

(iii) The blood vessels which lie below the brain are tortuous.

(iv) Stems do notgrow properly when their tips are cut.

(v) A person once attacked by small pox never suffers again.

(vi) There is striking similarity between man and monkey.

(vii) Enzymes are called as biological catalyst.

(b) Explain the importance of fertilizers and give two examples. 3

OR

(b) Write the names of various insectisides responsible for food pollution and explain how they pollute food. 3

Q. 3 Attempt any four of the following : 8

(i) Write chemical composition of raphides and cystollyth and write a simple test to detect.

(ii) Write a short note on grafting.

(iii) What are the causes of fainting ?

(iv) Write a note on distribution of animal in various eras.

(v) Write four symptoms of Malaria.

Q. 4 Attempt any four of the following : 8

(i) Write four preventive measures for Tuberculosis.

(ii) Write a short note on chromosomes.

(iii) Write common first aid to be rendered to the patient suffering from bone fracture.

(iv) How is brain protected ?

(v) Write differences between Grafting and Layering.

Q. 5 (a) Draw a neat figure of animal cell as it is seen under electron microscope and label following parts : 4

(i) Plasma membrane (ii) Endoplasmic reticulum

(iii) Nucleus (iv) Nucleolus

(b) Write an experiment to demonstrate that roots grow towards the soil. 4

PAPER 10

Q. 1 (a) Fill in the blanks with appropriate alternative and rewrite the statement :

(i) Disease diabetes insipides is caused due to under-secretion of ....

(a) Pituitory Posterior Lobe
(b) Pituitory anterior Lobe
(c) Thyroid gland (d) Thymus gland.

(ii) Cell theory was proposed by ....

(a) Robert Hooke and Schleiden.
(b) Robert Hooke and Schwann
(c) Sohleiden and Schwann
(d) Louis Pasteur and Robert Hooke.

(iii) Ribosomes are made of . , . .

(a) Fats (b) RNA
(c) DNA (d) Proteins

(iv) Human Somatic cell has .... chromosomes.

(a) 46 (b) 16 (c) 48 (d) 23

(v) Stem of .... performs the function of vegetative propogation.

(a) Guava (b) Clerodendron
(c) Water Hyacinth (d) Sweet potato

(b) Match the pairs 3

(i) Ovum	(a) Two sets of chromosomes
(ii) Zygote	(b) One set of chromosomes
(iii) Somatic cell	

Q. 2 (a) Give scientific reasons for any five of the following. 5

(i) To correct defect of short sight, use of concave lens is advised.

(ii) RBC can not divide.

(iii) Choroid layer contains black pigment.

(iv) In some cases newly produced plants are exactly identical with the parent plants.

(v) Fertile soil has large number of micro organisms.

(vi) Some people have squint eyes.

(vii) Reproduction is most important characteristic of living being.

(b) Give three examples of destruction of nature. 3

OR

(b) Write a brief note on Malthus theory. 3

Q. 3 Attempt any four of the following : 8

(i) Write in brief about cholera and typhoid bacteria.

(ii) Give two benefits of humus from agricultural point of view.

(iii) Make a list of chemical substances present in petrified tissues.

(iv) Write four kinds of responses shown by plants.

(v) What are the organs more susceptible to cancer ?

Q. 4 Attempt any four of the following : 8

(i) Write four differences between spyrogyra and onion cells.

(ii) Write the names of various kinds of bleeding and a characteristic of each.

(iii) Write a note on compost method.

(iv) Write the differences between insect pollinating and wind pollinating plants.

Q. 5 (a) Draw a neat diagram of middle ear and label following parts : 3

(i) Ear drum (ii) Eustachian tube

(iii) Malleus bone

(b) Draw excentric starch grain and label all the parts. 3

(c) Represent oogenesis diagramatically. 2

PAPER 11

Q. 1 (a) Fill in the blanks with appropriate alternative and rewrite the statement :

(i) Growth of .... gland is arrested as age advances. 5

(a) Pituitary (b) Thyroid

(c) Thymus (d) Pancreas.

(ii) .... showed that Zygote contains two sets of chromosomes.

(a) Mendel (b) Morgan

(c) Sutton (d) De vries.

(iii) Energy production is a function of ....

(a) Mitochondria (b) Plastids

(c) Ribosomes (d) Nucleus.

(iv) .... salts are useful for blood clotting.

(a) Iron (b) Magnesium

(c) Calcium (d) Copper

(v) Method of vegetative propogation is useful for the cultivation of ....

(a) Jawar (b) Cotton

(c) Sugar cane (d) Pumpkin.

(b) Match the pairs : 3

A	B
(i) Reduction in the length of human ear	(a) Variation
(ii) Extinction of leopard from India	(b) Mutation
(iii) Colour difference between two cats	(c) Natural selection
	(d) Use and disuse theory

Q. 2 (a) Give scientific reasons for any five of the following : 5

(i) Potato is a stem even though it grows underground.

(ii) Maize plant some time bears purple coloured grains.

(iii) Object is seen clear when image is formed at yellow spot.

(iv) Land should not be cultivated continuously.

(v) Pea plants having flower of contrasting colours, when crossed produce all flowers of red colour.

(vi) Shape or external pinna is irregular.

(vii) Crown grafting is done on old tree.

(b) Why is the conservation of forest must ? Give three reasons. 3

OR

(b) Write three benefits of study of Biology to human beings. 3

Q. 3 Attempt any four of the following : 8

(i) Write three means of destroying mosquitoes.

(ii) Write two differences between natural and artificial ecosystems.

(iii) Write a note on Earth crust.

(iv) Describe the responses seen in insectivorous plants to the stimulus of touch.

(v) Give advantages of (i) Use of tincture iodine on wounds.
(ii) Breathing in free air.

Q. 4 Attempt any four of the following : 8

(i) Write four preventive measures for cholera.

(ii) Write a note on starch grains.

(iii) Write uses of (i) Tourniquites (ii) Smelling salts.

(iv) Write two differences between sexual and asexual reproduction.

(v) Describe structure of androecium in typical flower.

Q. 5 (a) Draw a figure of cerebrum and label following parts : 3

(a) Sensory area (b) Motor area

(c) Auditory centre (d) Visual centre.

(b) Draw a verticle section of Banyan leaf showing excretory product. 3

(c) Define : (i) Accommodation (ii) Fertilization. 2

PAPER 12

Q. 1 (a) Fill in the blanks with appropriate alternative and rewrite the statement :

(i) .... is ' H ' shaped endocrine gland. 5

(a) Pituitary (b) Thyroid

(c) Thymus (d) Pancreas

(ii) .... is known as father of genetics.

(a) Mendel (b) Hugo De vries

(c) Lamarck (d) Louis Pasteour.

(iii) The second layer of plasma membrane is made up of ....

(a) Protein (b) Protein and fats

(c) Fats (d) Carbohydrates and fats

(iv) Nucleolus is situated in ....

(a) Nucleoplasm (b) Ectoplasm

(c) Endoplasm (d) Cell sap

(v) Process of regeneration is found in ....

(a) Potato (b) Sweet potato

(c) Bryophyllum (d) Guava.

(b) Match the pair : ६

A	B
(i) Zinjan thropus	(a) 1st stage
(ii) Homo sepian	(b) IInd stage
(iii) Australophithecus	(c) IIIrd stage
	(d) IVth stage

Q. 2 (a) Give scientific reasons for any five of the following : ५

(i) Some plants bear attractive flowers.

(ii) Inner skin of external ear contain fluid secreting glands.

(iii) When nucleus of one species of Acetabularia is replaced by nucleus of other species, then the shape of the cap also changes.

(iv) Bacteria in the nodules of leguminous plants are useful.

(v) Lamarck's theory is discarded.

(vi) After age of 40 the person can not see clearly the near objects.

(vii) For grafting plant growing in small pot is chosen as a stock.

(b) Explain in brief how forest are useful in maintaining natural balance. 3

OR

(b) State three uses and examples of chemical fertilizer. 3

Q. 3 Attempt any four of the following : 8

(i) What are the misconceptions about leprosy ?

(ii) Write two differences between physical and biological factors of environment.

(iii) Give examples of Rocks and minerals of organic origin.

(iv) Write the effects of temperature on growth of the plants.

(v) What do you mean by contributory factor of cancer ? Give examples of contributory factors.

Q. 4 Attempt any four of the following : 8

(i) How does Tuberculosis spread ?

(ii) Write a note on structure of mitochondria.

(iii) What is dislocation of joint ? What are its sign ?

(iv) What are the main part of nervous system ? Write names of the organ belonging to central nervous system.

(v) Write the functions of tongue.

Q. 5 (a) Draw a figure of animal cell as it is seen under electron microscope and label following parts : 4

(i) Mitochondria (ii) Vacuole

(iii) Endoplasmic reticulum (iv) Nucleus

(b) Write an experiment to show that response of root to water is stronger than gravity. 4

PAPER 13

Q. 1 (a) Fill in the blanks with appropriate alternative and rewrite the statement :

(i) At the middle part of the tongue . . . . taste is sensed 5

(a) Sweet (b) Sour (c) Salty (d) Bitter.

(ii) In somatic cell of man there are . . . . . chromosomes

(a) 16 (b) 23 (c) 46 (d) 48

(iii) . . . . is an effective medicine on Typhoid.

(a) Streptomycin (b) Chloromycetin

(c) Chloroquine (d) Dapsone

(iv) A vaccine against disease diseases Anthrax was discovered by . . . .

(a) Edward Jennar (b) Louis Pasteur

(c) Darwin (d) R. Kock.

(v) . . . . are necessary for the development of pigments.

(a) Red (b) Violet

(c) Ultra Violet (d) Infrared

(b) Match the pairs : 3

(i) Schwann & schleiden	(i) Genes located on chromosomes
(ii) Sutton	(ii) Cell theory
(iii) Morgan	(iii) Zygote contain diploid names of chromosomes
	(iv) Chromosomes made up of DNA.

Q. 2 (a) Give scientific reasons for any five of the following : 5

(i) Immediate control of bleeding is essential in first aid.

(ii) For cultivation of potato, pieces of tuber containing buds are used.

(iii) Pituitary gland is known as queen of glands.

(iv) Sensations transmitted from different parts of the tongue are different.

(v) Typhoid patient requires rest after recovery.

(vi) Man is known as Homo sepian.

(vii) The young cell has smaller vacuoles than old.

(b) What is fixation of nitrogen ? Describe two process helping fixation of nitrogen. 3

OR

(b) Give four examples of man's enchrochment on nature. 3

Q. 3 Attempt any four of the following : 8

(i) What does DNA molecule consist of ? What are the components of nucleotide ?

(ii) Make the list of organs belonging to male and female reproductive system in frog.

(iii) What is fossil ? Write a note on Petrifications.

(iv) What are the main types of nerves ? Give one example of each.

(v) Write four danger signals of cancer.

Q. 4 Attempt any four of the following : 8

(i) Write four symptoms of cholera.

(ii) Define :—(i) Hormone (ii) Tissue

(iii) What is first aid ? Why is it essential ?

(iv) Write four factors responsible for increasing nitrogen percentage in soil.

(v) Write a note on Antibiotics.

Q. 5 (a) Draw a figure of external ear and label all parts. 3

(b) Draw a figure of concentric starch grain and label the parts. 3

(c) Represent spermatogenesis diagramatically.

PAPER 14

Q. 1 (a) Fill in the blanks with appropriate alternative and rewrite the statement :

(i) Enlargement of .... leads to Exopthalmic goitre. 5

(a) Pituitary Anterior lobe

(b) Pituitary Posterior lobe (c) Thyroid

(d) Thymus.

(ii) . . . . showed that chromosomes were made up of genes.

(a) Mendel (b) Sutton

(c) Morgan (d) Darwin

(iii) Nuclear membrane consists of . . . .

(a) one layer (b) two layers

(c) four layers (d) three layers

(iv) Excentric starch grains are seen in . . . .

(a) Pea (b) Potato

(c) Rice (d) Wheat.

(v) Buds of . . . performs function of vegetative propogation

(a) Sweet potato (b) Onion

(c) Garlic (d) Dioscorea

(b) Match the pair : 3

(i) Tobacco	(a) 46 chromosomes
(ii) Frog	(b) 48 chromosomes
(iii) Maize	(c) 20 chromosomes
	(d) 26 chromosomes

Q. 2 (a) Give scientific reasons for any five of the following : 5

(i) If father has black eyes and mother has blue eyes then usually the children have black eyes.

(ii) Constancy in form and structure of organism is maintained in successive generations.

(iii) In sunlight the pupil is contracted.

(iv) Farmer alternates the crops.

(vi) A plant bearing coloured flowers produces colourless flowers.

(ii) For the cultivation of potato pieces containing buds are utilized.

(b) Explain how the natural balance is disturbed due to artifccial ecosystem. 3

OR

(b) Write three methods of preservation of fishes. 3

Q. 3 Attempt any four of the following : 8

(i) How will you determine that vaccination is successful ?

(ii) Write differences between symbiotic and denitrifying bacteria.

(iii) Make a list of chemical substances present in coal ball.

(iv) Write four responses shown by animals.

(v) Discuss in brief—' Sixty percent diseases spread through infected air food and water '

Q. 4 Attempt any four of the following : 8

(i) What are the main ways of spreading infectious diseases ? Give one example of each.

(ii) Describe movement of cytoplasm seen in hydrilla and tradescantia.

(iii) What is tourniquite ? What precaution would you take while using tourniquets ?

(iv) Write the names of physical factors of environment and write a short note on one of them.

(v) Describe structure of gynaecium and write function of each part.

Q. 5 (a) Draw vertical section of skin and label following parts :

(a) Hair (b) Touch corpuscules (c) Nerve 3

(b) Draw a figure of onion cell and label following : 3

(a) Nucleus (b) Vacuole (c) Cell wall

(c) Give one example of each : 2

(a) Multinucleate cell (b) Synthetic hormone

(c) Seedless fruit (d) Spiny pollen grains.

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PAPER 15

Q. 1 (a) Fill in the blanks by selecting appropriate alternative from the given and rewrite the statement : 5

(i) Oversecretion of .... causes thickness of skin.
(a) Thyroid (b) Thymus (c) Pituitary anterior lobe (d) Pituitary posterior lobe.

(ii) ..... was world renouned Indian paleobotanist.
(a) Dr. C. V. Raman (b) Dr. Birbal Sahni
(c) Dr. Mahabale (d) Jagdishchandra Bose

(iii) Movement of cytoplasm around central vacuole is seen in ..... plant.
(a) Hydrilla (b) Tradescantia
(c) Spirogyra (d) Acetabularia

(iv) Roots of ..... perform function of vegetative propogation.
(a) Turmeric (b) Clerodendron
(c) Oxalis (d) Bryophyllum

(v) Crystals present in Arum leaves dissolves in....
(a) Hydrochloric acid (b) Acetic acid
(c) Acetic & Hydrochloric acid (d) Citric acid.

(b) Match the pairs : 3

A (Scientist)	B (Principle)
(i) Charles Darwin	(i) Mutation
(ii) Lamark	(ii) Use & disuse theory
(iii) Hugo De vries	(iii) Struggle for existence
	(iv) Dominance & recessiveness of gene

Q. 2 (a) Give scientific reasons for any five of the following : 5

(i) The number of chromosomes after division of somatic cell remains constant.

(ii) Plants flowering in night bear white flowers.

(iii) Person suffering from cold experiences imitation in ear.

(iv) The bacteria found in nodules on roots of dicot are useful.

(v) Parents of blue eyed child may not be blue eyed.

(vi) Ginger though found in soil, is not a root.

(b) What are the three main problems before modern man ? 3

OR

(b) What is the contribution of Biology in service of man ? 3

Q. 3 Attempt any four of the following : 8

(i) Write four misconceptions regarding leprosy.

(ii) Write four points explaining importance of fossils.

(iii) Write two means of destructing mosquitoes.

(iv) Write two effects of intensity and duration of light on the growth of the plants.

(v) What is the first aid to be adopted for fainting ?

Q. 4 Attempt any four of the following : 8

(i) What are the general steps to be followed while giving first aid to person having bleeding ?

(ii) What are the common preventive measures for infectious diseases ?

(iii) What symptoms do you observe when malarial parasite enters in body ?

(iv) What is the explanation given by Lamark for elongated neck of modern giraffe.

(v) Write the names of various types of plastids and give function of any one of them.

Q. 5 (a) When do the plants reproduce by the method of vegetative propogation? Give the two examples of vegetative propogation. 3

(b) Draw vertical section of eye and label following parts : 3

(i) Iris (ii) Pupil

(iii) Yellow spot (iv) Blind spot

(c) Draw a neat diagram of neuron and label following parts : 2

(i) Axon (ii) Dendrons

PAPER 16

Q. 1 (a) Fill in the blanks by selecting appropriate alternative from given below and rewrite the statement :

(i) .... taste is sensed at the tip of the tongue. 3

(a) Sweet (b) Sour (c) Salty (d) Bitter.

(ii) There are .... chromosomes in human zygote

(a) 16 (b) 23 (c) 46 (d) 48

(iii) .... is an effective medicine on leprosy.

(a) Streptomycin (b) Dapsone

(c) Chloromycetin (d) Chloroquine

(iv) .... is the excretary product found in Arum leaves.

(a) Calcium carbonate (b) Glycogin

(c) Calcium oxalate (d) Gum

(v) Similarity in plant and animal response was demonstrated by....

(a) Dr. Birbal Sahni (b) Dr. Jagdish Chandra Bose

(c) Robert Hooke

(d) Louis Pasteur 3

(b) Match the pairs

A (Marine organism)	B (use)
(i) Gracilaria	(i) Edible fish
(ii) Prawns	(ii) For obtaining Oil
(iii) Sardine	(iii) Edible animal
	(iv) For obtaining jelly like substance.

Q. 2 (a) Give scientific reasons for any five of the following ; 5

(i) After fertilization the number of chromosomes in zygote becomes diploid.

(ii) The grafted portion is always covered by cowdung.

(iii) A person suffering from cold does not get sense of smell.

(iv) On the roots of pea plant there are nodules.

(v) Before using milk it must be boiled.

(vi) The neck of modern giraffe is long.

(b) What are the disadvantages of cutting the jungles ? 3

OR

(b) What are the three causes of air pollution ? 3

Q. 3 Attempt any four of the following : 8

(i) What measures should be adopted to prevent the spread of cholera in fares ?

(ii) What are the causes of water pollution ?

(iii) What is the effect of ultravioletrays and red light on the plants ?

(iv) What are the four main symptoms of leprosy.

(v) Why is garlic stem, though it is found in soil ?

Q. 4 Attempt any four of the following : 8

(i) Write four significant steps in human evolution.

(ii) What happens when the virus of jaundice enters in stomach throgh food ?

(iii) What is the effect of oversecretion of pituitary gland on the growth of man ?

(iv) What is the explanation given by Lamark for the limblessness of present snake ?

(v) What are the types of the nerves ? Give one example of each.

Q. 5 (a) Draw a neat diagrams of typical flower and label following parts : 5

(a) Calyx (b) Ovary (c) Corolla (d) Stamen

(b) Draw a diagram of middle ear and label following parts :

(i) Eardrum (ii) Stapes

(iii) Incus (iv) Malleaus

PAPER 17

Q. 1 (a) Fill in the blanks with the suitable alternatives given below and rewrite the statement :

(i) ..... has discovered Bacteria of Tuberculosis : 5

(a) Robert kock (b) Louis Pasteur

(c) Darwin (d) Lord Lister

(ii) Plant exposed to ..... attain maximum height.

(a) Red (b) Yellow (c) Blue (d) Green

(iii) Stem of ..... performs function of vegetative propogation.

(a) Oxalis (b) Clerodendron

(c) Bryophyllum (d) Agave

(iv) Cretinism and Goite are caused due to under secretion of ... .. gland

(a) Pituitary (b) Thyroid

(c) Thymus (d) Pancreas

(v) In human reproductive cell there are ..... chromosomes

(a) 16 (b) 23 (c) 46 (d) 48

(b) Match the pairs : 3

(i) Lobster	(i) Edible fish
(ii) Cod	(ii) Edible animal
(iii) Pom fretss	(iii) B Vitamin obtained
	(iv) Oil for soap obtained

Q. 2 (a) Give scientific reasons for any five of the following : 5

(i) The fractured bone is supported by wooden plank.

(ii) The grafted portion is covered by wax.

(iii) Your father can not see near object.

(iv) Injury to neck causes death.

(v) Modern snake is limbless animal.

(vi) During epidemic drinking water should be boiled.

(b) Write importance of fertilizers and give two examples of them. 3

OR

(b) How does urbanization affect natural balance of ecosystem ?

Q. 3 Attempt any four of the following : 8

(i) What is fossil ? Write three uses of fossils.

(ii) What is nucleotide ? What is it composed of ?

(iii) What is vegetative propogation ? Give two examples of it.

(vi) What are the main characteristics of civilized man ?

(v) A leaf of plant is inserted in closed test-tube containing KOH. After iodine test the leaf remains yellow. What would you conclude ?

Q. 4 Attempt any four of the following : 8

(i) What measures would you adopt to prevent mosquito bites ?

(ii) Why is potato considered stem even though it is found in soil ?

(iii) Write four evidences of evolution.

(iv) Write first aid to be rendered to the patient of bone fracture.

(v) Write four effects of oversecretion of thyroid gland.

Q. 5 (a) Draw diagram of Gynaecium of typial flower and label all parts. 3

(b) Draw vertical section of eye and label following parts :

(a) Choroid layer (b) Sclerotic layer

(c) Write six non living cell inclusions. 3

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